CORE 2 MOBO SHOOTOUT!
Get your Intel fix with two torture-tested motherboards

FREE MS OFFICE ALTERNATIVES?
We test the daylights out of 2 office suites—OpenOffice & Google Docs

ORIGAMI: PART 2
Reviewed: Samsung's second-gen UMPC!

MAXIMUMPC

Unveiled!

DREAM MACHINE '07

How to build your own stupid-fast wonder rig!

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- ✔ 4TB of storage

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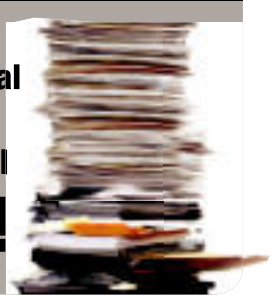

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KEEP YOUR WATER-COOLING RIG IN TIP-TOP SHAPE!

Ed Word

Time for a Multitouch Revolution

Please send feedback and brussels sprouts to ***will@maximumpc.com.***

A few months ago, I complained that the PC's basic shape and interface has remained unchanged since its birth. But since I wrote that column for the May 2007 issue, two new devices have made drastic changes to the user interface. And the products—Microsoft's Surface tabletop PC and Apple's iPhone—couldn't be more different.

In my March 2007 editorial, I told you why I'm waiting for the second-gen iPhone before I jump on the iPhone bandwagon, but I'll give you the short version here: last-gen data speeds and a lack of third-party applications sucks (see **http://tinyurl.com/2s6kms** for more). That said, I am super stoked about the phone's multitouch interface. Unlike virtually every other touch screen I've ever used, the iPhone's screen registers multiple presses at once. This not only makes typing on the touch screen easier but also opens up all sorts of new ways to utilize a phone's interface—you flick and tap the screen to navigate and pinch it to zoom. After spending a few minutes noodling with an iPhone in my friendly neighborhood Apple store, it's difficult to go back to a standard mouse and keyboard interface on my PC. It's just neat.

Microsoft's Surface tabletop PC, meanwhile, sits at the opposite end of the consumer electronics spectrum. I haven't had any hands-on time with Surface yet, but I have devoured all the info about it I can find (online, the best is *Popular Mechanics*'s video review at **http://tinyurl.com/3cecdk**). Surface takes the same type of multitouch technology that's built into the iPhone to the next level. In addition to incorporating interface advancements, Surface machines recognize the actual devices placed on their displays. For example, when you put a digital camera on the tabletop, Surface automatically downloads the images and displays them on the screen. If you want to copy an image to your cell phone, drop the phone on the table and drag the photo to the phone. Surface is still in development, but you can rest assured that Microsoft will have a whole host of Surface-like machines suitable for home use soon.

So what's next? Unfortunately, we'll probably see dozens of poorly working, rushed-to-market multitouch PC accessories designed solely to cash in on iPhonemania. However, I'd be shocked if Microsoft doesn't integrate multitouch into Vista's first Service Pack later this year, which should kick-start the first real mainstream interface advancements since the Mac popularized the mouse three decades ago.

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MAXIMUM PC

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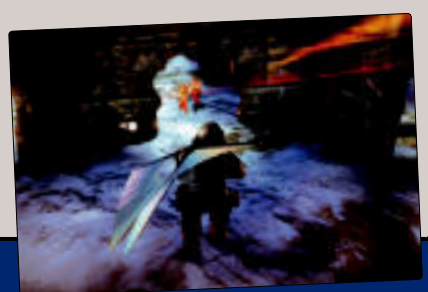

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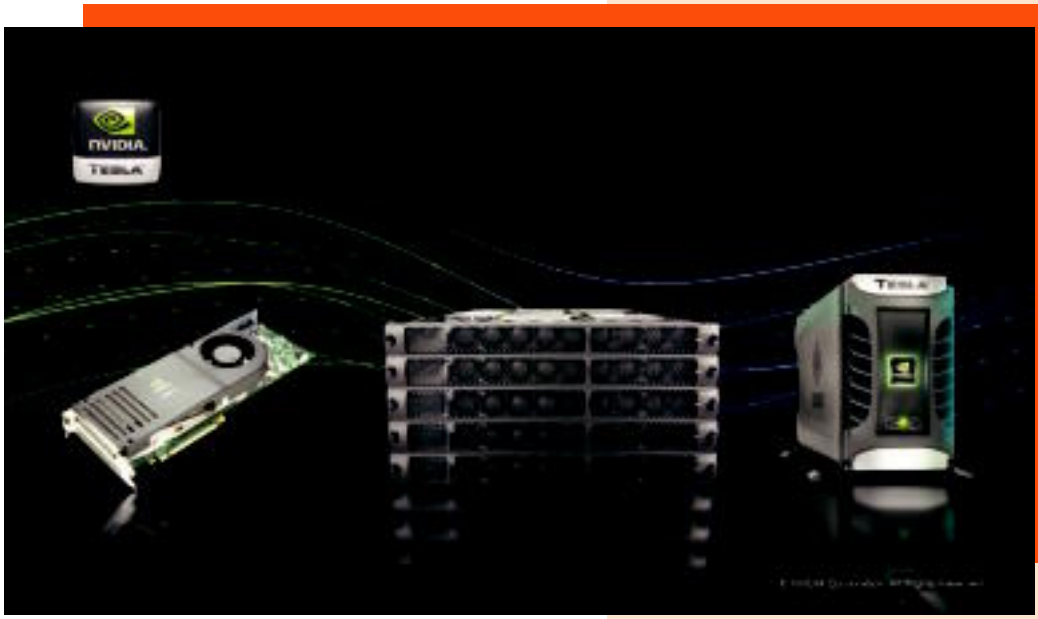
Nvidia Introduces a Supercomputer Line

New GPU products aimed at science and industry



Boston Scientific is using a Tesla-based supercomputer to design biomedical implants that are safe for use with diagnostic imaging tools such as MRIs.

Nvidia has launched an effort to develop an entirely new customer base for its graphics processors. Dubbed Tesla, the new product line consists of technology to build supercomputers designed for scientific and industrial applications using existing GPUs.

Tesla will leverage the company's existing top-end graphics processor, currently the G80 chip that forms the basis of the consumer-oriented GeForce 8800 GTX, to produce massively parallel workstations, desktop supercomputers, and rack-mount GPU servers. The G80s used for Tesla and Quadra products differ from those used to produce 8800 cards in one key way: They're capable of performing double-precision (64-bit) floating-point operations. This feature is removed from the dies destined for consumer products. Although Tesla won't have consumer applications, it will be interesting to watch a cluster of relatively inexpensive GPUs take on the likes of Cray and IBM.

Application developers will use Nvidia's CUDA (Compute Unified Device Architecture) C-language toolkit to create custom software programs to run on Tesla products. Nvidia first announced CUDA in November 2006, which gave developers a head start using Nvidia's Quadra line of GPUs. Evolved Machines, based in Palo Alto, CA, for example, is developing a Tesla-based system for reverse-engineering neurons in the human brain. Its product is being used to engineer devices that can not only sense and recognize objects and odors but also learn about new objects and odors. The company had been using x86 microprocessors to run its simulations but found that Nvidia's technology could run them 130 times faster.

As the general manager of Nvidia's computing group, Andy Keane, explains it, such dramatic increases in performance are possible because "a CPU has an incredible amount of technology designed to perform a certain type of work, but it's designed to handle one task at a time and to switch from one task to another very quickly. A CPU has large caches and other infrastructure designed to keep its execution pipeline full. GPU computing is very different. It's designed to perform tasks in parallel with a large cache of memory. We view GPU computing as being complementary to CPU computing."

Tesla is debuting in three forms: The Tesla C870 ($1,500) consists of a single 8-series GPU on a PCI Express card. The Tesla D870 ($7,500) features two 8-series GPUs in an external chassis. The top-of-the-line Tesla S870 ($12,000) houses four passively cooled 8-series GPUs in a rack-mount chassis that will also house a microprocessor to enable external management and 40 56mm cooling fans. Nvidia eventually plans to offer dual-GPU cards to enable 8-GPU server products.

SUPERCOMPUTER ARCHITECTURE COMPARISON

SUPERCOMPUTER	MANUFACTURER	PRIMARY PROCESSORS	FLOATING-POINT-OPERATIONS/SEC
Cray XT4	Cray	AMD Opteron	5.6 to 318 TFLOP
IBM Blue Gene/P	IBM	IBM PowerPC 450	13.9 TFLOP to 1.0 PFLOP
Nvidia Tesla	Nvidia	Nvidia 8-series	500 GFLOP to 2.0 TFLOP

Kiosk Confessionals

Dell overreacts to a former employee's 'tell all'—and then backpedals

The surest way to call attention to yourself is to try to force someone to stop talking about you. At least that's the lesson Dell learned when it attempted to quash an article listing 22 consumer tips written by a former Dell kiosk manager that was posted on The Consumerist (http://tinyurl.com/2lw67e).

The tips are fairly straightforward, many of them even common knowledge, and the former employee's intent was not malicious. But the insider information—such as a detailed description of Dell's promotional calendar—rubbed the company the wrong way.

Dell officials demanded that The Consumerist remove the post but succeeded only in creating more interest in the story. Within a couple days, Dell admitted defeat. "OK, we goofed," read the first item in a "23 Confessions" post on Direct2dell.com. The post went on to list the many ways Dell is trying to improve its customer relations.

AT&T to Push Pirates Offline

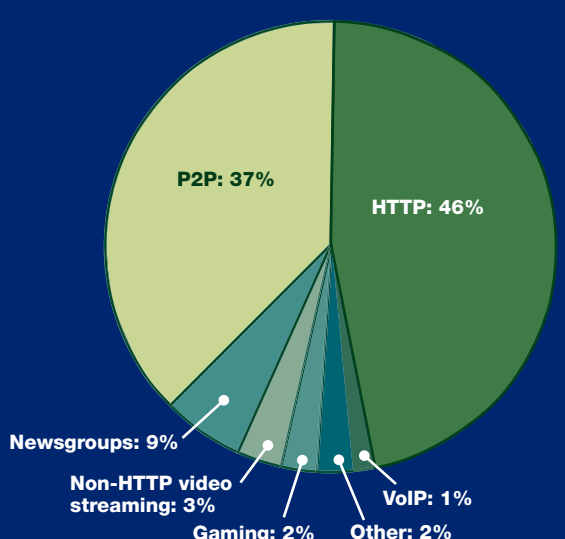
In a move that has the acronyms of the entertainment industry grinning from ear to ear, AT&T is making a commitment to keep pirated content off its network by adopting a yet-to-be-detailed technological solution. But it's the very vagueness that has industry critics lobbing their biggest complaints, as combating piracy across such a large network seems too Herculean a task not to run afoul of privacy concerns.

AT&T appears poised to go after its biggest bandwidth hogs: users who run servers of pirated content that clog the upstream of the nation's largest Internet service provider. AT&T hasn't said yet whether its antipiracy technology will focus on protocols—like BitTorrent—or actually analyze the contents of every packet.

The telecom faces large hurdles in its approach. Pirates could just as quickly adapt to the interference with a new transfer mechanism, à la Napster to BitTorrent—assuming, of course, that users are willing to subscribe to a service that snoops on them.

HTTP Traffic Overtakes P2P

Thanks to video-streaming sites like YouTube, more Internet bandwidth is consumed by web surfing than by the exchange of music and movie data packets—for the first time in four years



Communications equipment company Ellacoya Networks compiled the data from a study of 1 million North American broadband users.

TOM **HALFHILL**

Vacuums Make a Comeback

The first electronic digital computers had thousands of vacuum tubes, but within 20 years, the bulky glass tubes were superseded by cool-running transistors. Now vacuums are making a surprising comeback. Eventually, I think all microprocessors will adopt this new technology.

IBM has announced that some of its future processors will use tiny "air gaps"—actually, vacuum cavities—to insulate their internal copper wiring. Today, all microprocessors use solid dielectric materials for this purpose. These conventional materials are easier to deposit during the chip-fabrication process, and they also provide physical rigidity and help conduct heat away from the circuits. However, as circuits keep shrinking, chip manufacturers are struggling to invent new solid dielectrics with good insulating properties. Denser circuitry leaves less room for the dielectric. Inadequate insulation causes short circuits that can be fatal to the chip.

IBM, Intel, and other companies are already introducing low-k dielectrics, which are advanced solid materials with improved insulating properties. Now IBM is going an important step further. By adding some innovative processes to an otherwise conventional fabrication line, IBM is creating microscopic gaps around the chip's internal copper-wire traces. These sealed cavities contain near-perfect vacuums. A vacuum is the ideal insulator because it has the lowest possible dielectric constant, 1.0.

In practice, IBM's vacuum dielectrics don't quite reach the ideal dielectric constant because some solid dielectric material remains. IBM hasn't perfected a manufacturing technique that removes all the solid material. However, removing all the material isn't necessarily desirable at this point because it provides structural support and helps wick away the heat.

Vacuum dielectrics are a significant improvement, even when compared with low-k solid dielectrics. IBM says the vacuums can reduce the chip's resistance-capacitance delay by as much as 35 percent. Designers can make processors that run faster without using additional power, or that use less power without sacrificing speed, or that achieve some combination of those improvements.

One part of IBM's vacuum-gap technology is self-assembly nanotechnology, which has been widely misreported as tantamount to self-assembling chips. In reality, this technique is only one small step in the manufacturing process, in which a liquid material rearranges its molecular structure after deposition. It's clever, but the tiny vacuums are the real story.

Tom Halfhill was formerly a senior editor for Byte magazine and is now an analyst for Microprocessor Report.

GAME THEORY

THOMAS MCDONALD

AO-K

When the original *Evil Dead* was released, it became an object of morbid fascination among young horror fans for a single reason: It was unrated.

That's right, *Evil Dead* was so sick and twisted it couldn't even be rated!

Of course, we had to see it, which meant sneaking in. Did it warp our fragile little minds? Well, yeah, a bit. Did it turn us into antisocial mass murderers? Not that anyone can prove in a court of law, no.

And yet, it's not something to which kids should have ready access. The limited rating was exactly right, even though efforts to keep us out were farcical. And this was only *Evil Dead*, which is positively tame compared to the torture porn crowding multiplexes now.

A few years ago, that torture porn made the leap from movies to games with the execrable Manhunt, a game of remarkable sadism and violence that still managed to snag an M rating, perhaps because the ESRB ratings board was busy fumbling under the couch for its crack pipe. By the time Manhunt 2 showed up on its desk (in its rollout console versions), the ESRB was off the pipe and serious about being a good example of how an industry can police itself. They slapped that sucker with an AO (Adults Only) rating.

Naturally, the perennially irresponsible Rockstar Games was simultaneously outraged and overjoyed. Outraged because many major retailers refuse to carry AO games, thus affecting the bottom line. Overjoyed because now Rockstar can play the oppressed artist who has to censor its own work in order to get it out. ("Unrated Director's Cut Coming Soon!")

Nonsense. If Rockstar valued "artistic integrity" so highly, it would release the game as-is using alternate retail channels, damn the results. That's what Sam Raimi did with *Evil Dead*. But this isn't a beleaguered artist pushing the bounds of free expression: It's a company looking at the bottom line. It has no right to unfettered access to every corner of the marketplace. If Wal-Mart decides it doesn't want to carry a product, then tough luck, buddy.

And here's a little rule of thumb: If your "artistic integrity" relies in any way on Wal-Mart shoppers, then you don't have any, so just shut up about it.

Thomas L. McDonald has been covering games for 17 years. He is editor-at-large of Games Magazine.

Student Stands up to the RIAA

Lawsuit calls bunk on the org's method of fingering file-sharers

A Boston University student is challenging the RIAA's crackdown on campus P2P activity. For the last several months, the RIAA has been leaning on universities to deliver settlement notices to any student with an offending IP address. If that course fails, the RIAA files a John Doe lawsuit to obtain identity information from the ISP and then proceeds with legal action. It's this latter practice that prompted the BU student, known aptly as "John Doe," to file suit against the organization. At issue is the RIAA's right to subpoena information about an individual without that person's knowledge or ability to mount a defense. His case seems to have merit; the U.S. District Court for New Mexico recently denied the RIAA a similar discovery request.

Preview

LCDs with Real Depth

An alternative monitor technology could do away with the 3D dizzies

The biggest complaint folks have about using 3D monitors is that extended use can lead to headaches and even nausea. It's a consequence of stereoscopic imaging, in which a screen's pixels are divided into two nearly identical images with slightly different perspectives to trick your mind into perceiving 3D. Diminished image resolution and a narrow viewing sweet spot are two other shortcomings of the technique.

PureDepth (**www.puredepth.com**) has found a way around these issues with its Multi-Layer Display (MLD) technology. MLD utilizes two distinct LCD panels, one atop the other, separated by a buffering layer. So there's true depth between the screens, and when an image is separated between the two, with foreground info on one screen and the background on the other, the 3D effect is convincing—from any angle. A display driver can perform image separation on existing content, and the company plans to release simple programming tools that will allow developers to take full advantage of the tech. PureDepth predicts its MLD technology will be available in brand-name gaming monitors next year.

WiebeTech Mouse Jiggler

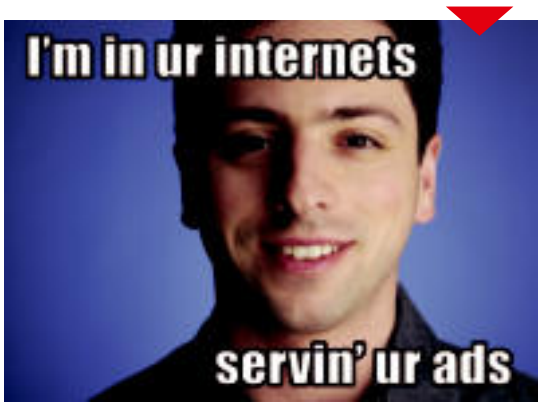
You may have perfectly valid reasons for not wanting your screen saver to flip on. But is a USB device that causes your mouse cursor to "jiggle" nonstop like a squirrel on speed really the answer? We think not. (To see how the Jiggler can be used for evil, check out http://tinyurl.com/2f5j4t.)

$30, www.wiebetech.com

Online Ad Acquisitions under Scrutiny

As the Internet's giants attempt to grow, the FTC investigates

Before Google, Microsoft, and Yahoo can move forward with their plans for continued online domination, they'll have to answer to the Federal Trade Commission. As we reported last month, all three companies recently made very high-dollar, high-profile purchases of large online advertising outfits—now the FTC is concerned about antitrust issues. So far, the FTC is conducting a standard review of Microsoft's purchase of aQuantive and Yahoo's purchase of Right Media. But Google faces a formal investigation over its purchase of DoubleClick. The focus will be not only antitrust issues but also privacy concerns, no doubt the result of an outcry by consumer advocacy groups following the purchase.



Google and Microsoft's Antitrust Dance

Google and Microsoft used to be content pitching dirt clods at each other—a little search function here, a PowerPoint knock-off there. But the two tech titans have since started complaining to the teacher, each asking the feds to investigate antitrust accusations against the other.

Microsoft started the fire in April when it raised legal criticisms over Google's acquisition of DoubleClick. But Google soon fired its own antitrust salvo at Redmond, WA.

In a 49-page document, also sent in April, Google asked the Justice Department to investigate Microsoft's desktop search functions that it bundles with Vista. Specifically, Google alleged that the "hardwired" search boxes make it difficult to use a non-Microsoft desktop search application. Google argued that Microsoft was violating a 2002 antitrust settlement that requires the company to assist competitors in making Windows-friendly software.

Microsoft capitulated to Google in June. Vista Service Pack 1 will allow users to select a default program for desktop search, although Microsoft's original Vista search function will still remain in the upper-right corner of Explorer windows. And Vista's Instant Search functionality will stay the way it is, much to the chagrin of Google's lawyers.

The Mountain View, CA-based search company didn't deem the changes sufficient though and subsequently asked U.S. District Judge Colleen Kollar-Kotelly to extend the government's oversight into Microsoft's compliance with the 2002 settlement. She's postponing her decision until later this year.

FUNSIZENEWS

OCZ BUYS PC POWER AND COOLING

PC makers aren't the only ones snapping up the competition. OCZ has purchased PC Power and Cooling for an estimated $13 million. OCZ said it bought the famed power-supply maker "to utilize their keen expertise in power management and take the organization to the next level."

PC Power and Cooling execs told *Maximum PC* that it will maintain the same quality and reliability but prices will be lowered as a result of OCZ's greater volume. Both OCZ and PC Power and Cooling lines of PSUs will continue to be offered.

BLOCKBUSTER BACKS BLU-RAY

Does it matter that Blockbuster is taking a stand in the high-def optical format wars? That's debatable given the chain's weakening hold on the movie-rental market. Nevertheless, Blockbuster is putting its eggs in the Blu-ray basket—at least at its 1,700 brick-and-mortar stores (both formats will be available for rental online). The decision was made after the company observed store-rental stats favoring Blu-ray over HD DVD.

$10 DSL ON THE DL

You're not alone if you've never heard of AT&T's $10-a-month broadband Internet service. That's because the company isn't advertising it. AT&T is required by the FCC to offer the supercheap service as a condition of its $86 billion acquisition of BellSouth, but there's no stipulation that it make the plan public. The near-secret service provides download speeds of up to 768Kb/s and uploads speeds of up to 128Kb/s—just like the company's $19.95 plan. It's available only in the 22 states that have never had AT&T or BellSouth broadband in the past.

MAXIMUM PC ONLINE

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FREE OFFICE SUITES

Google Docs & Spreadsheets **vs.** OpenOffice.org

Sometimes it can seem like Microsoft has a stranglehold on your daily life. Whether you're a flush Wall Street trader or a starving artist, you probably had to shell out the same $400-plus for a copy of Microsoft Office. But if you're willing to stray from the herd, you can get much of the same document-creating power without plunking down a dime.

For years now, a cavalcade of companies has offered free alternatives to Microsoft's wallet-crushing Office suites. Today, two of the leading choices are Google Docs & Spreadsheets and OpenOffice.org. Google offers an online-only option, while OpenOffice installs to your hard drive in tried-and-true fashion. Both offer robust, intuitive interfaces to handle the most common types of business documents.

As much as we love the notion of free software, we'd rather pay through the nose than put up with half-baked apps. So we put these two challengers through their paces to see whether one can stand up to Microsoft's monolithic business apps. Here's how the deathmatch went down.

BY ROBERT **STROHMEYER**

round 1

AVAILABILITY

Getting your hands on either Google Docs or OpenOffice.org is as easy as browsing to a web page. Google Docs lets you start editing instantly after you go to **http://docs.google.com** and log in to (or create) your Google account. OpenOffice.org has its URL right in its name, so just browse to the eponymous website and click "get OpenOffice.org," select your OS, and download the install file. If you live in a yurt on the Mongolian plains, you can order OpenOffice.org install CDs from a number of vendors for about $5 apiece. It's nice to have an offline option, but we prefer instant gratification.

WINNER: GOOGLE DOCS & SPREADSHEETS

GOOGLE DOCS & SPREADSHEETS
Free, http://docs.google.com

round 2

ACCESSIBILITY

A document editor is useful only if you can actually get to it (and to the documents it's meant to edit). You have to be online to use Google Docs, which pretty much rules out this option for business travelers who like to work on the plane. Plus, Google Docs can only work on files you've uploaded to Google (or created in Google Docs), which adds an extra step every time you want to work with a new file. OpenOffice.org, on the other hand, can be configured as your default app for its supported file types, which lets it launch automatically every time you double-click a Word or Excel document you receive from a coworker. If you have Google Toolbar installed, you can configure it to open Google Docs whenever you click a supported document, but again, this works only if you're online.

WINNER: OPENOFFICE.ORG

round 3

VERSATILITY AND FILE SUPPORT

If all you need is a quick and dirty way to read and edit text documents and spreadsheets, Google Docs can do the job without taking up any of your hard drive space. It reads and writes .doc, .rtf, .xls, and other formats, but if you want to create presentations or access database files, forget it. For those things, you need OpenOffice.org, which includes a PowerPoint-compatible presentation app and a robust database program that supports Access and MySQL, as well as other types of databases.

WINNER: OPENOFFICE.ORG

round 4

EDITING FEATURES

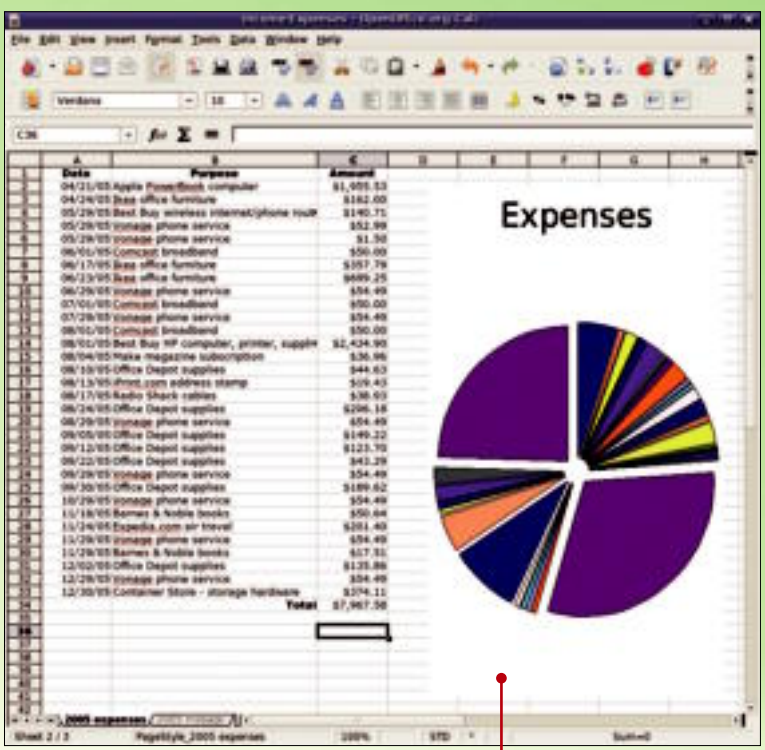
We're simple folk here at *Maximum PC*, but that doesn't mean we don't like a little fancy formatting to spruce up our documents. Google Docs's simple interface makes basic tasks easy, but it left us wanting more. With only a handful of fonts to choose from and just the most basic tasks available from the toolbar, Google's app is easily trounced by the option-packed menus of OpenOffice. While OpenOffice goes well beyond basic text formatting to let you draw, perform calculations in a text doc, and integrate multimedia, Google Docs poops out at basic revision tracking, word counts, and simple tables. Google Docs does, however, offer unique file-sharing options that let you collaborate with colleagues who also use the app. **WINNER: OPENOFFICE.ORG**

round 5

FINISHED PRODUCT

For most of us, the whole point of having an office suite is to share our work with others. Whether you're making a presentation to the board of directors, filing a software review to your editor at *Maximum PC*, or turning in a report to your biology professor, the finished product has to look good. OpenOffice gives you minute control over page layout and offers a variety of wizards to help you generate sweet-looking letters, agendas, faxes, presentations, and charts. What comes out of the printer with OpenOffice consistently looks like what you see on the screen, in the age-old WYSIWYG tradition. Google Docs & Spreadsheets does let you create basic charts in spreadsheets, but it tends to fall apart when it comes time to print. Because the app depends on your browser's print options, you have little control over things like margins and other page dimensions, unless you want to change them browser-wide.

WINNER: OPENOFFICE.ORG



OPENOFFICE.ORG
Free, www.openoffice.org

FEATURES

	GOOGLE DOCS & SPREADSHEETS	OPENOFFICE.ORG
ONLINE ACCESS WITHOUT INSTALLATION	**Yes**	No
OFFLINE ACCESS	No	**Yes**
WORD PROCESSOR	**Yes**	**Yes**
SPREADSHEETS	**Yes**	**Yes**
PRESENTATIONS	No	**Yes**
DATABASE	No	**Yes**
BASIC TEXT EDITING	**Yes**	**Yes**
ADVANCED MULTIMEDIA FORMATTING	No	**Yes**
RICH EDITING INTERFACE	No	**Yes**

And the Winner Is...

If you just need quick access to a word processor or spreadsheet editor once in a while, Google Docs can do the job. But for always-there accessibility, support for a broad spectrum of documents types, a rich interface, and highly polished results, OpenOffice.org doesn't just beat the pants off Google Docs & Spreadsheets—it also gives Microsoft Office a run for its money.

Our consumer advocate investigates...

✓OverclockCentral.com's Ancient Inventory ✓Removing Vista ✓Gateway Batteries

Jersey, ***watchdog of the month***

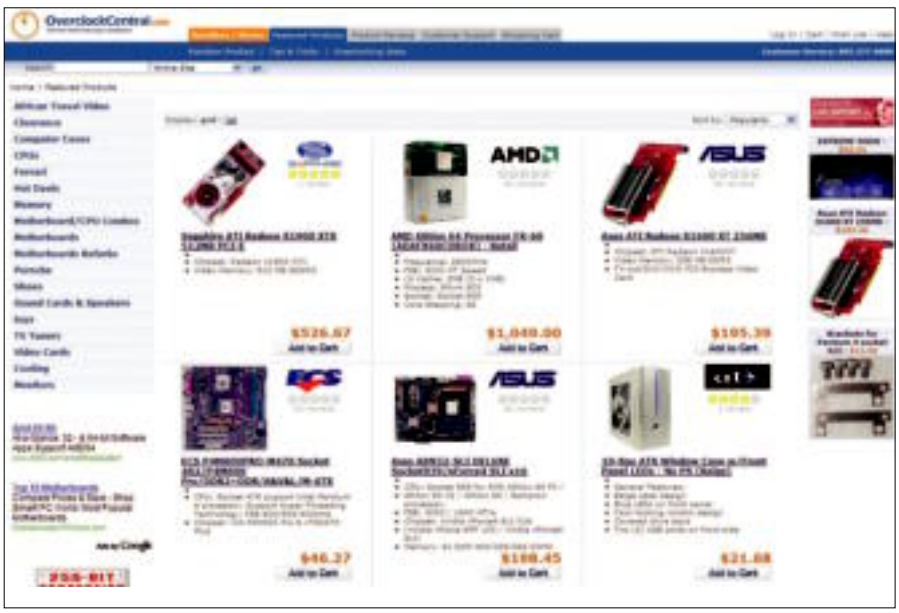
OVERPRICED.COM?

I don't know if OverclockCentral.com is real or not, but I thought you guys should look into it. Either the company went under and the website survived or it's a complete scam because I find it hard to believe some of these prices.

— Joe Maniaci

Joe, your concerns are valid, but the Dog doubts that anything malicious is occurring at the moment. It looks like www.overclockcentral.com is a website that got frozen in amber two years ago. For example, who would buy a 3.73GHz Pentium 4 Extreme Edition for $1,007? Or an ATI Radeon X1900 XTX for $526? What about that Athlon 64 FX-60 that the company wants $1,049 for? The Dog did a little digging and found that although the BBB gave OverclockCentral.com an F rating for unresponsiveness (what a surprise) only five complaints had been lodged. The tenor of the complaints at ResellerRatings.com, however, is certainly not good. The company has a lifetime review score of only 1.75 out of 10. The majority of problems relate to shipping issues.

The Dog's attempts to reach the company's owner were unsuccessful. The company's phone and fax numbers have been disconnected and searches of public-records databases yielded little information on the status of the company. The Dog did find, however, that the company's headquarters in Simi Valley, CA, is up for sale and is described as "vacant." As we went to press, the company's website was down, but we will update you if we discover any new information.



Wanna pay $1,049 for a CPU you can get for $300?

WE REALLY MEAN VISTA ONLY

Last February, I purchased a Toshiba Satellite A135-S2266 notebook PC with a Celeron M and 512MB of RAM at Best Buy. The box said it was "Vista ready," and when I booted the machine it had Windows Vista Home Basic installed.

I decided I didn't want to run Vista and attempted to uninstall it and load XP. After doing a clean format and installing XP, I couldn't get the onboard audio to work. When I called Toshiba customer support and explained my problem, I was told that my computer was designed to run only Windows Vista and that there was no workaround for running Windows XP. I was, however, offered a chance to upgrade my version of Vista. I was also told that running Windows XP and products designed to run on XP would void my warranty! I have tried multiple times to get XP to run properly, but there is always a hang-up with the sound drivers. I have even tried running Ubuntu Linux but have had the same problem. I feel like Toshiba is holding a gun to my head and forcing me to run something I don't want. The box said "Vista ready" not "Vista only." This is definitely a shakedown.

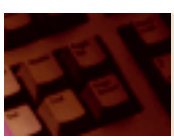
— Bob M.

Sadly, Bob, what you experienced has been a problem in the industry in recent years. After Microsoft introduced the 64-bit version of Windows XP, many PC-owners discovered that their rigs' warranties would be voided if they installed the new OS. But maybe those problems have helped solve the transition to Vista. When the Dog asked a Toshiba representative about it, he was assured that installing XP apps on the computer absolutely does not void the warranty. "If the customer owns an OS and wants to install it on their machine, it does not void their warranty," the rep said. "If the unit ever needs to be reformatted, the customer would need to reload their OS of choice. It is not uncommon for a customer to load a non-Windows OS."

So why was Bob told doing so would void his warranty? The spokesman believes that Bob may have talked to Toshiba Direct, the sales arm of the company, not Toshiba tech support. The spokesman said that the tech support division does not ever try to up-sell consumers to new versions of the OS.

However, that's not the end of the story. The Dog decided to pose as a customer and call a few OEM tech-support lines to see if installing XP on

Continued on page 20➔



Got a bone to pick with a vendor? Been spiked by a fly-by-night operation? Sic the Dog on them by writing **watchdog@maximumpc.com.** The Dog promises to answer as many letters as possible, but only has four paws to work with.

Continued from page 18

a Vista machine would void the warranty.

First up was Toshiba, where the tech wasn't sure initially but did eventually say that the warranty would still be valid if the Dog installed XP, but that the company "does not recommend installing XP." The Dell tech first told the Dog that the warranty would be voided but eventually came around to say that the hardware would still be under warranty. The HP tech said the warranty would still be good, but after checking with his supervisor came back to tell the Dog that, no, the warranty would be voided. However, reinstalling Vista would revalidate the warranty.

Why all the confusion? Eric Arnum, editor of WarrantyWeek.com, explained that saying the warranty is "void" is probably too strong. PC makers are really saying that if you make major changes to the OS that is installed on your PC, it is your responsibility to figure out why something went wrong. Arnum did say that most PC makers are probably technically correct in saying that they won't support the changed configuration, but that doesn't mean the companies have to be sticklers about it.

Indeed, one thing the Dog could get all three techs to agree on is that hardware remains covered even if there is a change to the OS. The problem is how to determine if a problem is occurring because of a hardware or OS problem. If the DVD player on your quad-core PC isn't working and you're running Windows 95, is the optical drive bad or is there some esoteric problem with Windows 95? When providing tech support, PC makers all begin with a set baseline of what should be on a rig. If your PC greatly varies from it, your chances of getting support are poor.

Arnum went on to say that the great majority of warranty issues PC OEMs must deal with are no longer hardware based; rather, more and more they are handling software-related issues.

All is not lost for you though, Bob. Reps at Toshiba's tech support told the Dog that you should first boot into the hidden partition in the notebook by pressing F11 during startup. From there, create a restore disc that will let you reimage the machine should you somehow destroy the hidden partition. But what to do about your problematic audio drivers? Try using the reference audio drivers from the chipmaker. The Dog isn't sure what sound part is in your notebook, but he thinks that it may be a RealTek ALC861. You should be able to download Windows XP drivers directly from www.realtek.com.tw. Unless you have a new part that the company does not support with drivers, there's no reason for the audio not to work with reference drivers.

Recall **Alert**

Gateway is recalling some 14,000 notebook PC batteries which may—you guessed it—overheat and pose a fire hazard. The company said that it has received four reports of battery packs overheating and, in some cases, causing minor property damage. The batteries were sold with Gateway 400VTX and 450ROG notebooks and carry the part number 6500760 or 6500761. Batteries that do not have this part number are not part of the recall and are presumed to be safe.

The batteries were manufactured in China and sold in notebooks nationwide between May 2003 and August 2003. Consumers are advised to stop using the recalled batteries and contact Gateway to receive a replacement battery. The PCs may still be safely used as long as the battery pack is removed. For more information, call Gateway at 800-292-6813 between 7 a.m. and 10 p.m. Central time Monday through Friday or visit www.gateway.com/battery. MPC

Gateway is recalling some batteries sold with its 400VTX and 450ROG notebook PCs.

Dream Machine 2007

Meet *the* Ultimate PC. Using top-class, premium parts, we build the best, fastest, most powerful PC possible! Watch it clock record scores!

PHOTOGRAPHY BY MARK MADEO
HAND MODEL: ALDO

BY THE MAXIMUM PC STAFF

You always hear, "It's what's inside that counts," but does anyone really believe that? We've never bought into that load of nonsense, you shouldn't either. Components matter most, but you're not going to put top-of-the-line parts in a bargain-bin mid-tower. Are you?

Every September, when we set out to build the year's Dream Machine, we have one simple goal in mind: Create the very best machine money can buy—inside and out. We build the fastest, most powerful, most authoritative rig in the world. Demolishing performance records set by lesser machines is just a happy side effect.

Sometimes, we cheat. We get prerelease hardware that's unavailable to common folk. In the past, we've tested dozens of CPUs, looking for the perfect overclocking candidate. This year, we didn't have any crutches—no prerelease hardware or fancy-pants paint jobs. This year, we relied on good ol' American muscle.

While past Dream Machines have been hand-built Formula One cars with custom hardware exclusive to the magazine, DM '07 is a supercharged stock car. It's equipped with factory parts anyone can buy, but, as always, our Dream Machine is *overclocked and ready to burn!*

Inner Beauty

One peek inside and you know that DM '07 means business

Phenom who? We couldn't thumb-twiddle any longer waiting for AMD's Athlon 64, err, Core 2 killer. Instead, we grabbed the fastest CPU on the planet, which is so readily available that we picked ours up in a vending machine. We're kidding about the vending machine but not about the performance. The 3GHz Core 2 Extreme QX6850 is the fastest CPU on the planet.

Did you see M. Night Shyamalan's latest movie, *Unbeatable*? Yeah, it stars two XFX XXX edition GeForce 8800 Ultra cards that beat the living crap out of AMD's Radeon CrossFire cards. Sure, a single 8800 Ultra costs more than most people pay for their entire system, and the two cards' massive 1.5GB frame buffer exceeds most folks' entire system RAM. But, those poor saps won't be playing Crysis on their rigs, will they?

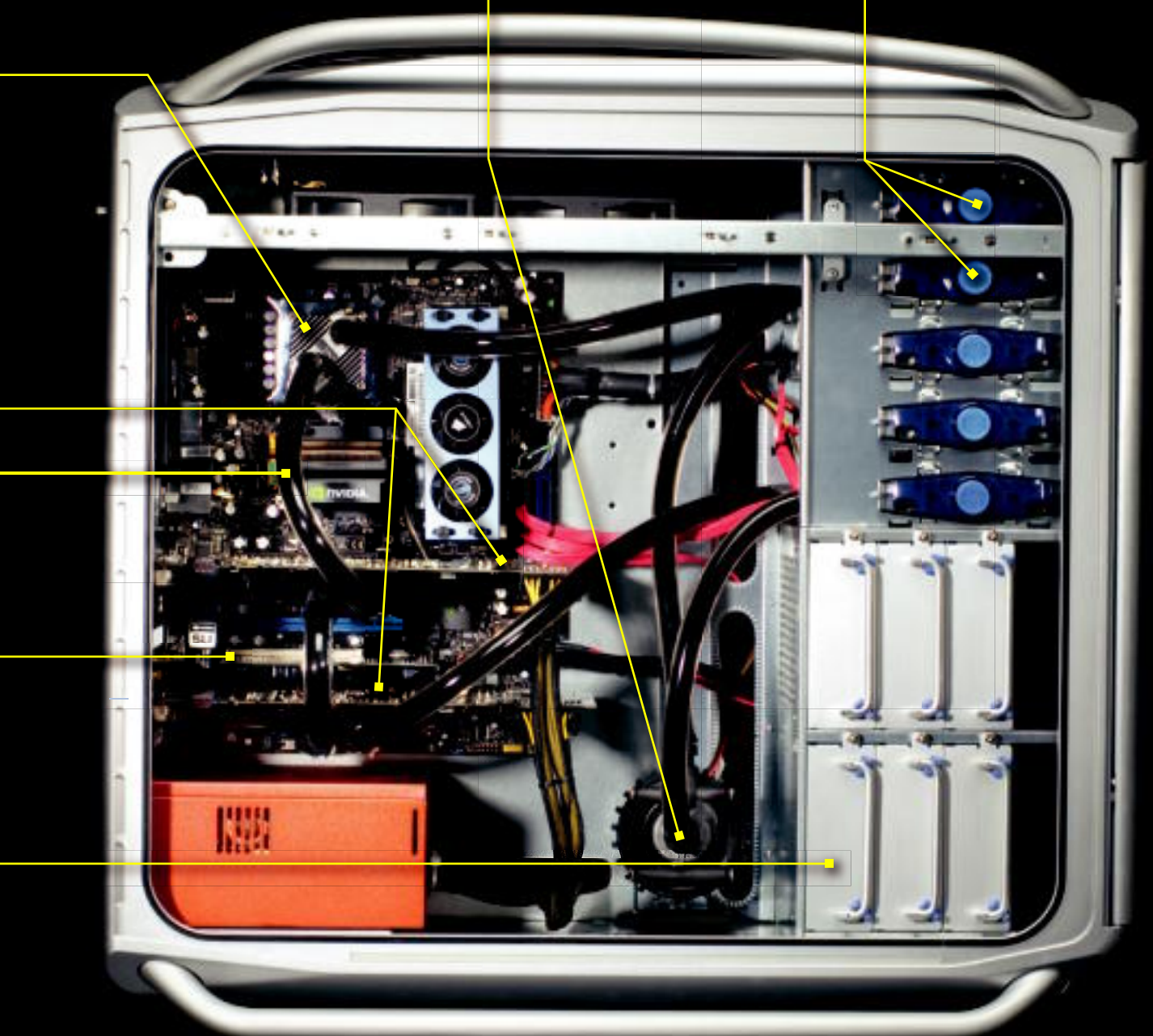
Everyone knows that good guys wear black, but did you know that they also water-cool in black? Using a combination of Swiftech and Danger Den parts, we liquid-cooled our quad-core CPU and graphics cards. Although black coolant isn't any better than red, orange, or blue, it looks more badass.

How much do we hate "free" onboard audio? Let's just say you can have our soundcard when you pry it out of our cold, dead, mouse-palsied hands. This Creative Labs Sound Blaster X-Fi XtremeGamer Fatal1ty card is a dear, trusted friend that we just won't sacrifice.

It's pretty hard to innovate with a drive bay, but Cooler Master's Cosmos does just that. The case sets a new standard with its pull-out drive holders. Just place your drive in the little compartment, give it a screw or two, and stick the whole package back into the case. It makes storage look sharp and helps conceal those cables!

Laing's D5 pump is simply awesome. It's absurdly quiet, even when you kick the variable speed setting up to the pump's highest output—4,800RPM, which spits out fluid at nearly 317 gallons per hour. The pump's barbs are the perfect tightness for 1/2-inch tubing. It can be a bit of a wiggle to get the tubing on, but you won't need a hose clamp when you're done.

This drive-bay locking gadget tops our favorite-features list for the Cosmos. Just stuff your parts in the front and then push the big, blue button. One press locks your device; another frees it from its bonds. That's it. No screwing necessary, and you don't even have to take off the case's other side panel!



CPU

Intel Core 2 Extreme QX6850

1,333MHz front-side bus finally arrives in the new 3GHz chip

When it came time to choose our CPU, Intel made us an offer we couldn't refuse. OK, so Luca Brasi didn't hold a .38 to our temple, but when you compare the 3GHz quad-core Core 2 Extreme QX6850 ($1,000, **www.intel.com**) to every other publicly available CPU, the choice is obvious. It mows down the benchmarks *and* the competition—including AMD's vaunted quadfather—like it's the St. Valentine's Day massacre.

Although our Dream Machine's CPU is new, it's similar to what you've seen before. It has the same 8MB of L2 cache, the same Core microarchitecture, and the same socket support as the Core 2 QX6800. The main difference is the front-side bus, which runs natively at 1,333MHz instead of a mere 1,066MHz. Remember, the cores communicate via the FSB, so that added bandwidth is welcome.

For DM '07, we overclocked the stock 3GHz chip to 3.66GHz. Although the QX6850 doesn't clock up like its lesser siblings (low-end chips tend to overclock farther than top-bin chips), we're still talking about speeds well in excess of 3GHz. That's some blazingly fast number crunching.

MEMORY

Corsair Dominator 10000

A controversial RAM decision: Is 2GB dreamy?

Dream Machine is all about going hog wild, but we do show some restraint when excess has no bearing on performance. Case in point: We could have easily slotted 4GB of RAM into this year's Dream rig, but why? We're not convinced that having 4GB of main system RAM with a 32-bit OS is even useful, as you won't be able to access all of it. The 2GB we do use comes from Corsair's award-winning Dominator series ($610, **www.corsair.com**). It gives us the Corsair reputation in addition to a couple of wicked black heat spreaders.

MOTHERBOARD

EVGA nForce 680i SLI

Overclockability means more to us than bling

We were faced with a tough decision when choosing a board for this year's Dream Machine. We could have gone with the flashy features of the Asus Striker Extreme or the all-out overclocking potential of EVGA's nForce 680i SLI board (reviewed January 2007, $250, **www.evga.com**). In the end, we decided to go for broke with EVGA's offering. A good thing, too, as overclocking a quad core can be a bitch. Luckily, the nForce 680i SLI didn't let us down. We successfully pushed our quad past its 3GHz stock speed to 3.66GHz fairly easily. We couldn't get past 3.5GHz with the Striker without blowing chunks. Why not Intel boards? Going nForce gives us SLI support—something you certainly can't get on Intel's new P35 boards.

COOLING

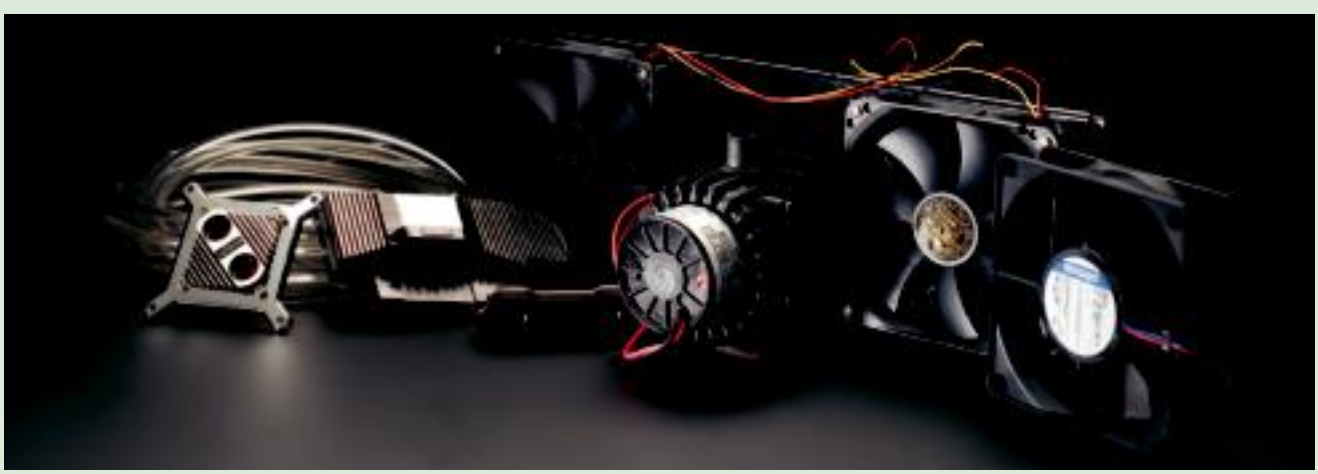
Custom Water-Cooling Craziness!

The heck with kits. With Dream Machine, it's BYOC—bring your own cooling

You can buy a complete water-cooling kit from your favorite online retailer, but we've found that the best way to approach the oh-so-finicky combination of liquids and electronics is to fashion a custom system using the best parts from several manufacturers. Like a child before his birthday, we assembled a dream list of cooling parts from two of our favorite suppliers, Danger Den and Swiftech.

While we were tempted to cool every single hotspot on the mobo, we decided that the disadvantages of running an elaborate multi-radiator cooling rig outweighed the meager benefits. Instead, we settled on a traditional CPU/GPU loop using a Swiftech Apogee GTX water block ($75, **www.swiftnets.com**) for the former and two of the company's stealth VGA water blocks ($110 each) for the latter. The blocks get the difficult cooling job done, but more than that, installation is absurdly easy.

Laing's D5 pump, Danger Den part number DD12V-D5, ($90, **www.dangerden.com**) is our Dream Machine's workhorse. It's a beastly fellow that spits fluid at a maximum rate of approximately 315 gallons per hour, pushing our coolant around with nary a sound. We rounded out the loop with generic 1/2-inch tubing, a Danger Den reservoir filled with custom black coolant, and a Swiftech radiator.



VIDEOCARD

XFX GeForce 8800 Ultra XXX Edition

Over the top? Of course! This is the Dream Machine, dude

As much as we hate being predictable, we had to go with an Nvidia-based videocard for this year's Dream Machine—for the third year in a row. Yes, we're talking about GeForce 8800 Ultras in SLI. But we're sure you saw this one coming, since AMD's ATI brand managers have decided not to play in the high end of the market this product cycle. (Wimps!)

The Dream Machine is all about being the best, so not just any 8800 Ultra cards would do. We picked a pair of XFX's XXX Edition boards (reviewed August 2007, $875 each, **www.xfxforce.com**) because they run at blistering speeds: The core is clocked at 612MHz, the shader units spin at 1.67GHz, and the 768MB frame buffer hums along at an amazing 1.15GHz.

POWER SUPPLY

PC Power and Cooling Silencer 750 Quad

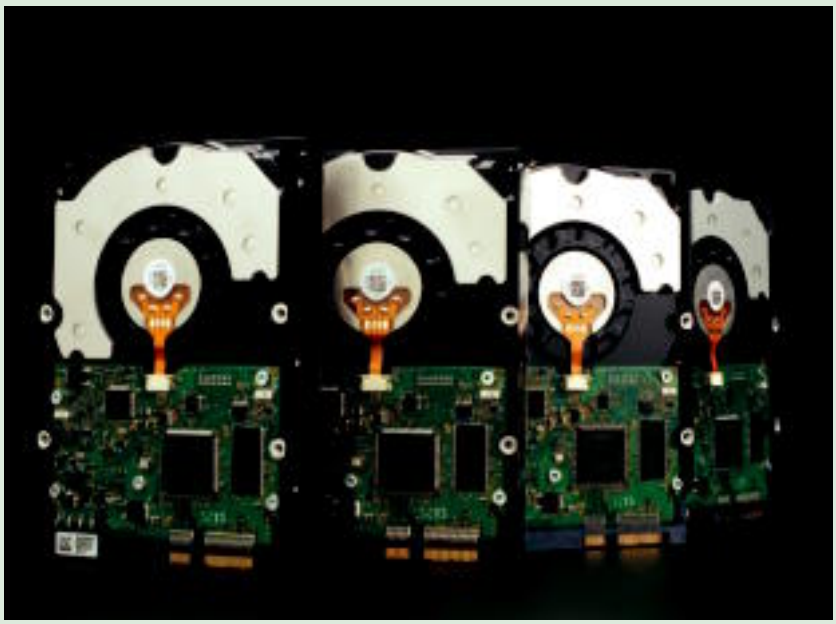
Our 750 is like other people's 1,000-watt PSUs

What, you thought we needed a kilowatt PSU to run this year's Dream Machine? Maybe if we had selected units from lesser manufacturers, but this SLI/CrossFire-ready PSU delivers more than enough juice. Even better, the unit uses a single-rail design to power all components. While other PSU-makers sport multiple rails, which don't make efficient use of resources, the Silencer 750 Quad ($190, **www.pcpower.com**) puts the power where you need it. Since we've never had a PC Power and Cooling unit fail in our Lab (aside from the one we dropped), we're confident that this one won't cough up a capacitor and drop dead the first time a brownout or power surge strikes. To seal the deal, PC Power and Cooling built this PSU with custom cable lengths, just for DM '07. Now, if a PSU company would just do that for everybody….

STORAGE

Four Hitachi 7K1000 Terabyte Drives

If they came any bigger we'd need a corral, not a case



So why did we go with Hitachi's mighty 7K1000 drives (reviewed July 2007, $400 each, **www.hgst.com**) for the Dream Machine? For the answer, we need but a word: terabyte. At the time of our rig's construction, Hitachi was the only player to have a fully functioning terabyte drive on the market. And once you've enjoyed the sweet taste of 1,000 gigs, you just can't eat elsewhere.

More than that, the 7K1000's performance is almost as impressive as its size. Its speeds stomp that of every competitor, save Western Digital's 10,000RPM Raptor drive. Still, the Hitachi 7K1000 holds its own against that tiny roadrunner. We're rocking two of them in a RAID 0 configuration for maximum performance, with the other two floating as independent drives—perfect for backups, or approximately 3 billion lolcat pictures.

OPTICAL DRIVES

LG GGW-H10NI Super Multi Blue and Asus DRW-1814BLT

Next-gen optical supremacy without any sacrifices

There are two big reasons LG's GGW-H10NI Super Multi Blue (reviewed on page 75, $1,200, **www.lge.com**) is an obvious choice for this year's Dream Machine. The first is versatility. The Super Multi Blue reads Blu-ray *and* HD DVD discs, so we're free to watch any damn movie we want. Obviously, we'd love it if the drive could also write to both formats, but since consumer-priced HD DVD burners don't exist, we'll gladly settle for the Super Multi Blue's superior Blu-ray burn speeds—reason number two. Spec'd at 4x, this burner can fill a single-layer BD-R disc in less than half an hour, versus the competition's typical 45-minute run.

The LG drive's 8x DVD+R burn speeds aren't stellar, which is why we're using our mobo's sixth SATA port to run Asus's DRW-1814BLT (reviewed August 2007, $50, **www.asus.com**). The 18x DVD drive affords us single-layer burns in less than six minutes.

SPEAKERS

Creative GigaWorks S750

Bring some boom into your room

The GigaWorks S750 speakers ($500, **www.creative.com**) bear the Creative badge, but their Cambridge SoundWorks heritage is evident the moment you crank up the volume. That's not to say Creative doesn't make good audio products, just that its SoundWorks division knows how to design and build awesome speakers that are as easy on your ears as they are on your wallet.

The two additional two-way surrounds in this 7.1-channel system make a huge difference in positioning audio events around your head, and the thundering subwoofer, with its beefy 210-watt BASH amp, serves up scrumptious bass that punches you in the chest. These attributes render this speaker system absolutely perfect for gaming, listening to music, and watching movies on your PC.

DISPLAYS

Dual Dell 2707WFPs

Two screens, one heck of a panorama

It's true that Dell's 2707 (reviewed May 2007, $1,400 each, **www.dell.com**) sports the same 1920x1200 resolution as its 24-inch sibling, but it's a big step up as far as we're concerned. Perhaps it's our advancing age, but we like how everything from text, to icons, to thumbnail views gets a size boost on the 27-inch screen. That greater visibility comes in handy when your dual-display desktop spans nearly four feet from side to side!

Other niceties include the 2707's stylish aesthetics, its accommodating ergo options, a plethora of inputs, a built-in four-port USB hub, and a 9-in-2 media reader. Shoot, *one* of these screens is decadent. Two are indeed the stuff of dreams.

SOUNDCARD

Creative Labs Sound Blaster X-Fi XtremeGamer Fatal1ty Pro

Say boo to crappy onboard audio

As long as we have breath in our nerd lungs, as long as there is sound in our ears, and as long as we have a slot to fill, we won't accept noisy, host-based onboard sound—which in this case, is about as bad as can be thanks to the EVGA board's damned EAX-cheating RealTek chipset. For DM '07, discrete audio is essential. Don't believe us? Plug a pair of earphones into your mobo's audio, then try the X-Fi XtremeGamer Fatal1ty Professional Series (reviewed April 2007, $120, **www.soundblaster.com**)—you'll never want to go back. The subtle sound changes of a vehicle's acoustic signature as it moves through different environments will give you reason enough to ditch onboard.

INPUT DEVICES

Keytronic Classic-U2 Keyboard and Logitech G5 Version 2

Without kick-ass input devices, our Dream Machine would be a wrist-crippling nightmare

We could have picked a newfangled wireless keyboard for the '07 Dream Machine and some sort of crazy three-dimensional mouse, but instead we went back to basics. With variable sensitivity, four easy-access buttons, and a tilting scroll wheel, Logitech's second-generation G5 ($70, **www.logitech.com**) is the ultimate take-no-prisoners gaming mouse.

And our keyboard—the Keytronic Classic-U2, in black ($45, **www.keytronic.com**)—is just that, a classic. With superb key action and an incredible lifetime warranty, it's hard to pass up. If we were weak-wristed and in need of ergonomic support, we'd pick up Microsoft's Natural Keyboard 4000 instead, which remains our favorite orthopedic model.

OPERATING SYSTEMS

Windows XP Professional and Windows Vista Ultimate

Vista's not ready for full-time use, but a dual boot means it's ready when the time calls for it

We've included Windows XP on every Dream Machine since 2001 because it's fast and reliable, and we're extremely comfortable with it. This year, we're including Vista on the second partition of our Dream Machine in the hope that it will grow to fill Windows XP's mighty shoes during the course of this rig's life.

Gaming is, of course, our main reason for dual-booting this year. While the meager selection of Vista-only titles out now doesn't inspire us—Shadowrun and Halo 2, *pshaw*—the future holds much promise. We can hardly wait for the DirectX 10 goodness coming down the pike in games like Crysis and Hellgate: London.

CASE

Cooler Master Cosmos

Simplicity meets sexy in Cooler Master's chassis

Cooler Master's Cosmos ($200, **www.coolermaster-usa.com**) is one of the nicest chassis we've ever tested, and that's saying a lot, considering the bounty of enclosures we get in the Lab every month. CM certainly covered the bases with this one, as nearly everything is customized or customizable.

The front panel's smooth, black door gives way to five grilled bay covers, which pop out with ease. You don't need a screwdriver to install any 5.25-inch peripherals into the slots; the case's proprietary mechanisms—simple push-button locking devices—make the process exceedingly simple.

Since we like our Dream Machine to look clean, we applaud Cooler Master's foresight when it comes to cable management. From the pull-out hard drive bays to the design of the motherboard backboard, this case is built to be neat and tidy. Heck, the Cosmos even comes with handles on both the top and bottom that give the case a fresh style, assist in transportation, *and* improve airflow (by lifting the case's inlets off your sweet shag carpet).

Benchmarking the Beast

Of the 12 Dream Machines we've built in as many years, this one is far and away the fastest

Since the inception of this magazine, the Dream Machine has always been about building the very best machine possible using the best components available at the time. To get there, we wheedle, cajole, push, and beg vendors for their newest unreleased parts. Sometimes we get 'em, and sometimes we don't. This year, there was no magic bullet, but we still managed to build a righteous rig—even without a nitrous tank under the passenger seat or a blower poking through the hood.

This year's Dream Machine represents the very best PC a person can build right now. Bar none. How do we know? We didn't just grab the parts and go. We actually tested other options as well—including AMD's Quad FX platform, equipped with a pair of dual-core Athlon 64 FX-70 CPUs, and an Intel V-8 system using a pair of quad-core 3GHz Xeons. In the end, we decided that Dream Machine '07's configuration was the best blend of performance for today and tomorrow.

THE NUMBERS DON'T LIE

To judge the performance of our Dream Machine, we reached for our standard benchmark suite, which we use to measure the performance of the many primo PCs that enter our Lab. The suite includes Adobe's Premiere Pro 2.0 and Photoshop CS2, Nero's Recode 2.0, Monolith's FEAR, and Raven's Quake 4. We also continue to use BAPCo's applications test, SYSMark2004 SE, but the benchmark has proved finicky over the last year and runs only 20 percent of the time on bone-stock machines.

So how fast is the Dream Machine? One look at our benchmark chart will tell you it's pretty damned fast. Our aging zero-point system consists of a dual-core Athlon 64 FX-60 with 2GB of DDR400 and a pair of Nvidia GeForce 7900 GTX cards. That's not a config to scoff at—it's still within the bounds of a high-end machine. Yet against our zero point, the Dream Machine pulls in scores that are almost 100 percent better in every category. In FEAR, the DM's lead is 120 percent. Keep in mind that these benchmarks aren't even fully multithreaded to take advantage of our overclocked quad-core CPU. So pat yourself on the back, Dream Machine, you decimate our performance standard-bearer.

More critical readers are probably saying, "So what? Beating up on a moldy-old Athlon 64 is no big whoop. How about the real challengers—those $7,000 to $10,000 machines you review each month?"

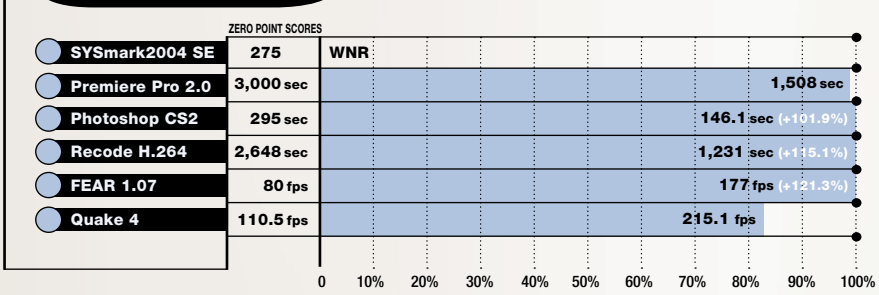
That's where the fun begins. We compared the Dream Machine's numbers to every single rig we're reviewed this year.

Many of these PCs feature similar components, but even when stacked up against that fearsome lineup, Dream Machine fared well, setting benchmark records in Nero Recode 2.0 and FEAR. In Premiere Pro, Dream Machine trails the fastest rigs we've tested—Falcon Northwest's $10,000 Mach V (reviewed June 2007) and Overdrive's $7,250 Core2.SLI (reviewed August 2007)—by a mere 0.7 percent. The Mach V, running at an overclocked 3.73GHz, outmuscled DM '07 in Quake 4 thanks to its clock-speed advantage. The three-month-old Mach V doesn't have the advantage of our new Ultra cards running in SLI, however, and it takes a beating in FEAR, where the Dream Machine is 27 percent faster.

It's also worth mentioning that Overdrive's Core 2.SLI just barely holds the Photoshop CS2 record. But really, the difference in scores between the top four machines in this test is negligible.

To sum up, Dream Machine sets two records (albeit by slim margins) and holds its own against a stable of the fastest PCs on the planet. Not too shabby, if we do say so ourselves.

BENCHMARKS



Our current desktop test bed consists of a dual-core 2.6GHz Athlon 64 FX-60, 2GB of Corsair DDR400 RAM on an Asus A8N32-SLI motherboard, two GeForce 7900 GTX cards running in SLI mode, a Western Digital 4000KD drive, a Sound Blaster X-Fi, a PC Power and Cooling Turbo Cool 850, and XP SP2.

All Together Now!

The whole is greater than the sum of its parts—but, boy, is each part purty

The Cosmos comes with a cover for the top of the case, which when removed gives you space to mount a radiator. If that doesn't appeal to your aesthetic sensibilities, you can do what we did for the Dream Machine—mount the radiator inside the case and have the fans suck air through the cover's air intakes.

Our Dream Machine demands monitors that can meet the challenges of any content—be it an action-packed game, a highly nuanced digital photo, or a movie disc strapped with HDCP. Dell's 2707WFPs do that and then some.

While we went old school with a classic black Keytronic keyboard, we plugged the very newest gaming mouse into this year's Dream Machine. The latest rev to Logitech's G5 retains the kick-ass adjustable sensitivity and weight system and adds a second thumb button.

PAYING THE PIPER

All this hardware doesn't come cheap; here's what it would cost to pick up the tab on the 2007 Dream Machine

CATEGORY	NAME	PRICE	URL
CPU	Core 2 Extreme QX6850	$1,000	www.intel.com
MOTHERBOARD	EVGA nForce 680i SLI	$250	www.evga.com
VIDEOCARDS	2 XFX GeForce 8800 Ultra XXX Edition	$1,750	www.xfxforce.com
MEMORY	2GB Corsair Dominator 10000	$610	www.corsair.com
HARD DRIVES	4 Hitachi 7K1000	$1,600	www.hgst.com
COOLING	Hybrid Swiftech/Danger Den Water Kit	$510	www.swiftnets.com, www.dangerden.com
CASE	Cooler Master Cosmos	$200	www.coolermaster-usa.com
SOUNDCARD	Creative X-Fi XtremeGamer Fatal1ty	$120	www.creative.com
MONITORS	2 Dell 2707WFP	$2,800	www.dell.com
OPTICAL DRIVE	LG Super Multi Blue	$1,200	www.lge.com
OPTICAL DRIVE	Asus DRW-1814BLT	$50	www.asus.com
KEYBOARD	Keytronic 104-key Classic	$45	www.keytronic.com
MOUSE	Logitech G5 v2	$70	www.logitech.com
POWER SUPPLY	PC Power and Cooling Silencer 750 Quad	$190	www.pcpower.com
SPEAKERS	Creative GigaWorks S750	$500	www.creative.com
OPERATING SYSTEM	Windows XP Professional	$300	www.microsoft.com
OPERATING SYSTEM	Windows Vista Ultimate	$400	www.microsoft.com
TOTAL		**$11,595**	

Too many multimedia speaker systems squeeze by with single-driver speakers—that's not good enough for Dream Machine. We tapped Creative's GigaWorks S750 because its front, center, and *four* surround-sound channels are outfitted with 3.5-inch midrange drivers and 1.0-inch titanium tweeters. And its amp pumps 70 watts into each of them.

ORGANIZE YOUR LIFE

WITH A WIKI

Store (and share) all your important information in a personal online repository that's easy to update and maintain!

BY GINA TRAPANI

Everyone with a hyperactive brain needs a simple tool to organize lists and notes, and a special type of website, a wiki, could be just the ticket. (The name comes from the word *wikiwiki*, which is Hawaiian for "quick.") A wiki is an editable website, like the one that powers the popular online encyclopedia Wikipedia. Anyone can add, update, and remove pages on a wiki site using just a web browser and easy-to-use, free software—no text editor or special knowledge is required.

While Wikipedia proves that wiki software enables large groups to collaborate, wikis have a lot to offer individual users, too. You'll realize this when we show you how to build your own knowledge base and organization center with a wiki installed on your local PC.

Gina Trapani is the founding editor of Lifehacker.com and author of *Lifehacker: 88 Tech Tricks to Turbocharge Your Day* (Wiley, 2006).

Install Instiki

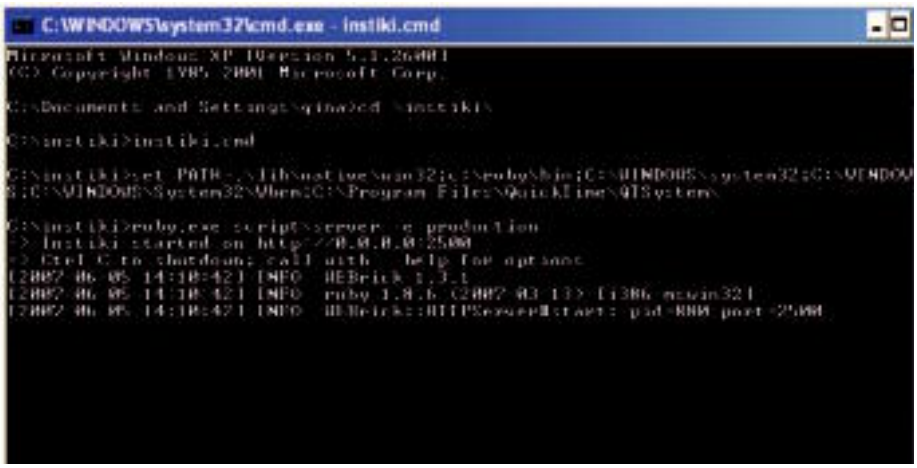
Instiki—free, simple wiki software—is easy to set up and use. It's written in a programming language called Ruby, so you'll need to start by installing the Ruby engine. Here's how to get Instiki running on Windows:

1. Set up Ruby. Download Ruby from **http://tinyurl.com/yd23cy**. Look for the Ruby on Windows section and download the One-click Installer. Run the installer using the default settings.

2. Set up Instiki. Download the Instiki.zip file from **http://instiki.org**. Extract the package to a folder on your computer. Rename that folder instiki and move it to the root of your C: drive.

3. Run Instiki. From Windows's Start menu, choose Run. Type `cmd` in the Open text box and click OK to launch the Windows command line. Switch to the Instiki directory using the `cd \instiki\` command.

4. Start the Instiki server by typing `instiki.cmd` and pressing Enter.



Start Instiki for the first time in the Command Prompt window.

Configure Instiki

Once Instiki's installed and running, it's time to visit your new wiki. Switch to a web browser and type your Instiki installation's address into the location bar. It will be available at **http://localhost:2500/** .

There you'll see Instiki's initial setup page, where you can set your wiki's name (you can use My Stuff) and an optional password to require administer privileges to change Instiki settings. When you're done, click the Setup button. Congratulations! You've got your own personal wiki running.

Keep in mind that your wiki will be available only when instiki.cmd has been executed—otherwise, your web browser will give you a "page not available" error. Check out the sidebar below for more information on starting Instiki automatically as a Windows service.

Set your wiki's title and password and click the Setup button.

RUN INSTIKI AS A SERVICE

Instead of using the command prompt, you can run Instiki as a Windows service. The Instiki service can start automatically with Windows every time you reboot (so you don't have to do it manually), and it eliminates the unsightly Command Prompt window from your taskbar. Get instructions on how to run Instiki as a Windows service here: http://tinyurl.com/2pc5gm .

Windows Firewall may pop up and ask if you want to block the Ruby interpreter. Choose Unblock to access your Instiki server.

Edit and Create Wiki Pages

Immediately, your new wiki confronts you with a gaping, empty text area. Remember: A wiki is a website *you* author, so the home page is empty until you fill it. Thus, the first thing you should do with your wiki is fill in the home page

Instiki's page edit mode has three components: the text area on the left containing the page's current content (none on a newborn wiki), a text formatting guide on the right, and the Submit button next to an author name on the bottom.

To add text to your home page, simply type in the text area. Before you submit your changes, you can set the author name to your name (by default it's AnonymousCoward). Specifying the author's name is more important on a group wiki, where others are likely to check to see who made what updates. If this wiki is for your personal, individual use, it's not as necessary.

Once you press Submit, you'll see your newly created home page, which contains the text you entered. From there, you can click the "Edit Page" link on the bottom-left of the page to change or add to the page's content.

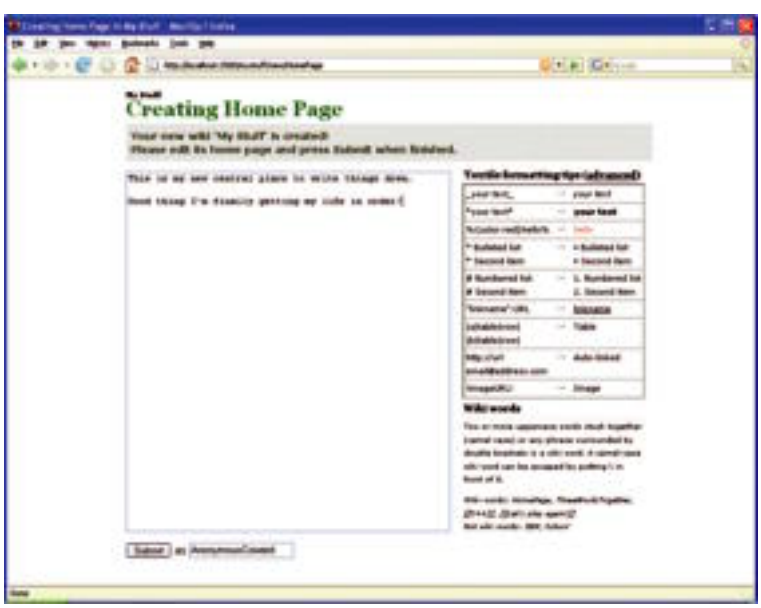
Keep in mind that a wiki is not just one web page. It's a collection of as many web pages as you wish to create, interlinked using what are called "wiki words." Double square brackets designate a word or phrase as a wiki word. You'll use wiki words to create new pages and link to wiki pages throughout your Instiki web.

For example, if you want to create a to-do list on your wiki, first click Edit Page on the home page. Somewhere inside the home page text area, add the wiki word `[[My To Do List]]`. Save your changes. Your new home page will contain the phrase "My To Do List" with a question mark next to it (minus the brackets). The question mark indicates that the wiki word points to a page that hasn't been created yet. To compose the My To Do List page, click the question mark and you'll be in the new page's edit mode. From there you can start entering your list.

Once you get comfortable editing your wiki's pages, you'll want to format your text to your liking for easy readability. Instiki uses the Textile markup language by default and offers a quick guide to Textile formatting on the right side of the edit mode. For example, to create a bulleted list, add an asterisk (*) to the beginning of each line item. When you save your changes, you'll see you've created a bulleted list of items with those asterisks, like the one seen here.

- TAKE CLOTHES TO THE DRY CLEANER
- MAIL THE RENT CHECK
- FINISH WRITING WIKI ARTICLE

Likewise, you can bold, italicize, and color text in your pages and create numbered lists, tables, headings, images, and links to external web pages.



Create your new home page: Just type into the text area and click the Submit button.

Instiki's Textile formatting tips detail special wiki markup that formats the text in your pages.

Put Instiki to Good Use

most specialized software applications—like a project planner or calendar package—your [redacted]esn't have predefined fields for specific es of information. You can create any num-ber of pages, linked from one another in any structure you choose based on the wiki words you enter. Every page is just a wide-open text area, and you format its contents however you choose. Therefore, there's no to the types of information you can store in i. Here are some ideas:

[redacted]Whether it's a to-do list, grocery list, or laun-our Instiki wiki's a great place to stow it. one item per line or use the asterisk to bul- While you can't cross items off a list in your wiki, Instiki stores page-revision history over time. So you can click the "See changes" link at the bottom of any page to see items that have been added to a list (in green) and removed (in red) backward and forward through time.

BOOKMARKS: Add web-page links to your Instiki wiki using the yourlinkname:http://example.com notation. Alternatively, simply enter a URL into a page, and Instiki will automatically make it clickable. While plenty of web-based services—such as del.icio.us—can store your bookmarks online, storing links in your Instiki wiki keeps them private and doesn't limit the amount of information you can enter along with them.

SOFTWARE SERIAL NUMBERS AND WEBSITE PASSWORDS: You just plunked down $50 for the latest version of your favorite software package, and you want to store the license key information in a safe, central place—like your wiki. Create a Serial Numbers page and keep a list of all the license keys you've collected over time. Use the same technique for low-security website passwords: Whenever you create a new login, drop it into your wiki for safekeeping.

RECIPES: Copy and paste your favorite chicken recipe into your wiki, and when you experiment with the ingredients, update the page with your adjustments. The wiki's free-form structure makes it perfect for recipes—you can include images, ingredient lists, notes on preparation, and links to the original recipe on the web. And when you're craving your favorite chicken and mushroom dish? Just type "chicken mushrooms" into Instiki's search box to retrieve the recipe.

RESEARCH: Planning a party, work event, vacation, or home-improvement project? Collecting information for a report at work? Your wiki's a great place to save web clippings, phone numbers, directions, and addresses, which you can search by keyword later.

WISH LISTS AND GIFT IDEAS: Your wiki's an easy, private place to store wish-list items and gift ideas with links to buy the items online or reminders about what her favorite wine or his favorite cologne is, so you'll be ready when a special occasion arises.

DIGITAL DIARY: When was the last time the dog got shots? Or you got the oil changed? Or the kids went to the dentist? How many cigarettes did you smoke today, or pounds did you lose this month, or miles did you run this week? Your personal wiki's a good place to log information like this for instant recall later on.

HOLIDAY CARD LISTS: Easily track the names and addresses of people you sent cards to and whom you received cards from in your personal wiki. If you enter each person on one line, with each piece of information separated by a comma (e.g., name, street address, city, state, zip code) you can easily copy and paste the text from your wiki page into Excel or an online card service to do a quick mail merge. Also, Instiki automatically links email addresses for one-click message composition from any page.

A page of information in Instiki is free-form and can contain lists, links, section headings, and paragraphs.

MEDIAWIKI, AN ADVANCED WIKI PACKAGE

Advanced users who want the features of the granddaddy of all wikis, Wikipedia, can install the software that runs the online encyclopedia, MediaWiki (http://mediawiki.org). MediaWiki is a free, open-source wiki package that requires considerably more setup time but offers advanced configuration options and features, including user registration and login, page discussion, reverse page links, more text formatting options, design customization, and file uploads. To run MediaWiki, you need the PHP programming language engine and the MySQL database server installed on your computer—both are free but are aimed at developers, not casual users. Also, you have to manually edit a PHP file in order to start MediaWiki. Many affordable website hosting packages come with PHP and MySQL for installing software like MediaWiki—or might even come with MediaWiki preinstalled. The advantage of installing MediaWiki on your web host is that you can access it from any Internet-connected computer.

Instiki Tips and Tricks

Once your wiki's an essential part of your digital information store, you'll want to take advantage of it as much as possible. Here are some advanced Instiki usage tips and tricks.

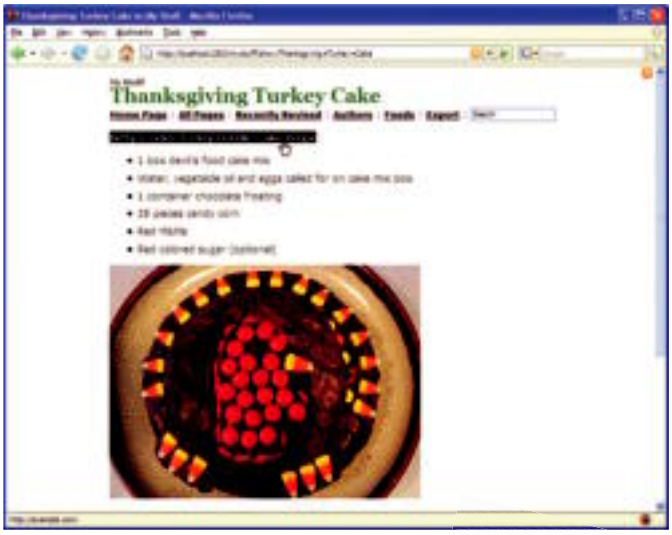
ROLL BACK CHANGES: Make an edit to a page that you regret later? Here's the beauty of the wiki: Every version of every page is available to view, compare against the current version, and restore. To roll back a page to a past state, click "See changes." Using the "Back in time" and "Forward in time" links, locate the version you want to restore and click the "Rollback" link.

VIEW YOUR WIKI INDEX: Keeping track of all the pages you've created in your wiki isn't an easy task, especially if you've linked them from subpages several layers in from the home page. Luckily, Instiki does it for you. Click the All Pages link at the top of any page to view an alphabetical list of pages in your wiki on the left; on the right, you can view a list of "orphaned pages"—that is, any pages that have no reference via a wiki word elsewhere.

EXPORT YOUR WIKI PAGES: Instiki can export a copy of your entire wiki as a set of interlinked web pages or as Textile markup for importing into another wiki package. To do so, click the "Export" link to the left of the search box and click either HTML or Markup to download a zip file of your wiki's pages in the respective format. This is the perfect way to back up your wiki data into a read-only format on a thumb drive or CD.

A wiki page of website passwords can contain links to login pages as well as usernames, passwords, and even notes about the site or account.

Click on "Show Changes" to view edits to your My To Do List page.



A recipe page—like this one for a Thanksgiving Turkey Cake—can contain links, lists, and even images.

I put everything on my wiki now

SKIP THE INSTALLATION WITH PBWIKI

The hosted service PBwiki (http://pbwiki.com) is the perfect way to test your wiki legs without installing anything on your computer. Register at PBwiki and you'll get a full-featured wiki with unlimited pages, 10MB of space to upload files and attachments, page comments, and an optional wiki password for access control. A free PBwiki option is available, with paid upgrades for extra features like backup, advertisement-free pages, traffic statistics, lockable pages, and a custom domain. MPC

ANOTHER MAXIMUM PC CHALLENGE

THE DOUBLE-BLIND MUSIC-LISTENING TEST

Can you hear the difference between AAC songs encoded at 128Kb/s bitrates and those encoded at 256Kb/s?

The first cracks in the record industry's mind-numbingly dumb position that commercial music must be encumbered with soul-sucking digital rights management technology have begun to appear: Apple—in partnership with EMI—is hawking DRM-free music at twice the bitrate of its standard fare (256Kb/s vs. 128Kb/s) and charging a $0.30-per-track premium. We're all for DRM-free music, but 256Kb/s still seems like a pretty low bitrate—especially when you're using a lossy codec.

So we decided to test a random sample of our colleagues to see if they could detect any audible difference between a song ripped from a CD and encoded in Apple's lossy AAC format at 128Kb/s and the same song ripped and encoded in lossy AAC at 256Kb/s. Does the higher bitrate deliver additional value, or is the added cost justified solely by the absence of DRM?

We hypothesized that no one would be able to discern the difference using the inexpensive earbuds (MSRP: $30) that Apple provides with its product, so we also acquired a set of high-end Shure SE420 earphones (MSRP: $400). We were confident that the better headphones would make the task much easier, since they would reveal more flaws in the songs encoded at lower bitrates.

—BY MICHAEL BROWN

THE SUBJECTS

Our 10 test subjects range in age from 23 to 56. Seven of the 10 are male. Eight are editors by trade; two are art directors. Four participants have musical backgrounds (defined as having played an instrument and/or sung in a band). We asked each participant to provide us with a CD containing a track they felt intimately familiar with. We were hoping participants would choose a diverse collection of music, and they did: Classical, jazz, electronica, alternative, straight-ahead rock, and pop were all represented. (See the chart on page 52 for song specifics.)

METHODOLOGY

We used iTunes to rip the tracks from a source CD (once at 128Kb/s and again at 256Kb/s) and copied them to a fifth-generation 30GB iPod. We asked each participant to listen with the Apple buds first and to choose between Track A and Track B or express no preference. We then tested using the SE420s and asked the participant to choose between Track C and Track D or express no preference. The tests were administered double blind, meaning that neither the test subject nor the person conducting the test knew which tracks were encoded at which bitrates.

LOOK FAMILIAR?

We originally posted this story on MaximumPC.com. We added some new information for this print edition, including an examination of the personal-identity information Apple includes in DRM-free iTunes tracks, as well as looks at several other sites that offer DRM-free music.

THE RESULTS

The absence of even a single country music fan was just one of the surprise findings of our challenge

COLOR US CORRECTED

The biggest surprise of the test actually disproved our hypothesis: Eight of the 10 participants expressed a preference for the higher-bitrate songs while listening with the Apple buds, compared to only six who picked the higher-quality track while listening to the Shures. Several of the test subjects went so far as to say they felt more confident expressing a preference while listening to the Apple buds. That didn't necessarily translate into a preference for the Apple buds, however (more on that later).

LEAVE IT TO THE OLD FOGEYS

Age also factored differently than we had expected. Human hearing tends to deteriorate as people get older, but all three of our subjects who are over 40 years old correctly identified the higher bitrate tracks using both the Apple and the Shure earphones. Three of the four subjects aged between 31 and 40 correctly identified the higher bitrate tracks with the Apple earbuds, but only two were successful when listening with the Shures. Two of the three under-30 subjects picked the higher-quality tracks with the Apples, but only one from that group made the right choice with the Shures. All four musicians picked the higher-quality track while listening to the Apples, and three of the four were correct with the Shures.

Despite being less able to detect the bitrate of the songs while listening to the Shure SE420 earphones, eight of 10 subjects expressed a preference for them over the Apple buds. Several people commented on the Shure's ability to block extraneous noise. While listening to the SE420s, one person remarked, "Wow, I'd forgotten that wood-block sound was even in this song." Another said, "The difference between the Shure earphones and the Apple earbuds was more significant than the difference between the song encoded at 128Kb/s and the one recorded at 256Kb/s." One of the two people who expressed a preference for Apple's product told us, "It seemed like I got better kick from the bass."

THE WEAKEST LINK

Could it be that the performance of the Shures masked the flaws in the tracks encoded at lower bitrates? We typically experience just the opposite: High-end listening gear tends to reveal flaws. Your audio system is only as strong as its weakest link, and if you're using cheap earphones, you're missing out on what your MP3 player is capable of delivering. The SE420s fit tight inside your ear canal, so they isolate your ears from extraneous noise. Many of our listeners found that they could turn the player's volume down significantly because the earphones weren't compet-

Continued on page 54➔

THE TEST TRACKS

ARTIST	ALBUM	TRACK	LISTENER COMMENTS
ANDRES SEGOVIA	The Legendary Andres Segovia in an All-Bach Program	Chaconne (from Violin Partita No. 2)	"I've listened to this recording 40 billion times. I know every nuance in it.
GUNS N' ROSES	Civil War	Use Your Illusion II	"This song is meant to be played loud. Axl Rose's voice and the guitars should help me tell the difference."
HÜSKER DÜ	New Day Rising	Celebrated Summer	"I've been listening to a lot of Hüsker Dü lately. Sometimes you rediscover a band and wonder why you haven't listened to them for so long."
MASSIVE ATTACK	100th Window	Future Proof	"I know this song so well. I figured I'd be able to tell if I'm hearing everything that should be there."
MINGUS BIG BAND	Gunslinging Birds	Jump Monk	"I'll be listening for dynamic range in the horns. I think I'll perceive differences in the sound of the piano solo and the upright bass, too."
NINE INCH NAILS	Year Zero	The Great Destroyer	"It has the typical chord progression of a pop song, and then it goes into this crazy techno solo. I thought the variety would help me identify the differences in the bitrates."
STEELY DAN	Aja	Josie	"This may be the world's most fanatical band when it comes to recording. One of the things I'll be listening for is the chimes in the opening."
STEVIE WONDER	Original Musiquarium I Vol. II	Sir Duke	"I think I'll be able to hear the difference in the sound of the horn section at the beginning of the song—I think it will sound brighter at the higher bitrate."
SUNDAY'S BEST	Where Are You Now?	Truest You	"The drummer in this band is cymbal crazy. I think it will be hard to capture that sound accurately at a low bitrate."
TEA LEAF GREEN	Taught to Be Proud	If It Wasn't for the Money	"This is from a CD that I listen to a lot; I'm very familiar with it."

Continued from page 52

ing with environmental racket. That not only makes your listening experience more enjoyable, but can also prevent hearing loss.

Despite what Apple charges for a set of its replacement buds, the earphones that come with 90 percent of the digital media players on the market are throwaway items—they're only in the box so you'll have something to listen with when you bring the player home. Do yourself a huge favor and dump 'em. Spending a few bucks more for something that sounds better, feels better, and will last longer just makes sense; after all, you only get one set of ears in life.

WHERE'S THE VALUE?

To our subjects' ears, there wasn't a tremendous distinction between the tracks encoded at 128Kb/s and those encoded at 256Kb/s. Despite the fact that most people identified the higher-quality track, no one was absolutely certain about their choices with either set of earphones, even after an average of five back-to-back A/B listening tests. That tells us the value of Apple's and EMI's more expensive tracks lies solely in the fact that they're free of DRM restrictions.

And as much as we dislike DRM, we just don't think DRM-free tracks alone are worth paying an extra 30 cents for. Interestingly enough, you can buy an entire album encoded at the higher bitrate for the same price as the album encoded at the *lower* bitrate. But if you purchased the lesser-quality album through iTunes previously and now want to upgrade, you're screwed: Apple will charge you 30 percent of the original album price for the higher bitrate.

In the end, Apple's move doesn't change our opinion that the best way to acquire commercial digital music remains buying CDs: You can rip and encode them at any bitrate you want, you can transfer them to any device you want, you won't have any DRM issues to worry about, and you won't have to pay anything extra for them. If Apple wants to

Continued on page 56

IDENTITY TAGS IN ITUNES

Just because a music track lacks DRM doesn't mean you can use it any ol' way you choose

Apple and EMI are giving online music buyers what they asked for: songs that can be played on any device. But the absence of DRM doesn't grant us the right to share the music we've purchased with anyone we choose. That's piracy, and it's both illegal and immoral.

Although there is no DRM embedded in these tracks, there is information that could be used to trace the song back to you should you decide to share it—especially if it's put on a peer-to-peer network. This is nothing new—it's always been in iTunes tracks. To find it, launch iTunes, right-click any song you've purchased, and select Get Info. Click the Summary tab and you'll see information related to the song (size, bitrate, sample rate, etc.), the date you purchased it, how many times you've played it, the name of the person who purchased it, and the buyer's iTunes account name.

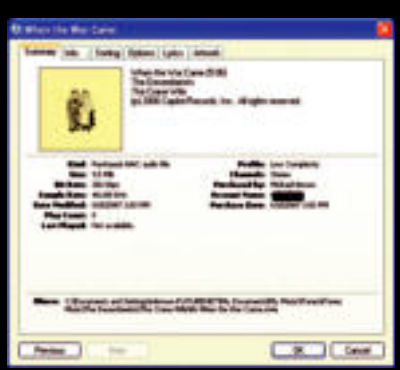
Apple can't use this information to track you or what you're doing, but it can trace music that you've illegally shared back to you. If you lose your iPod or someone steals it and uploads the music to a P2P site, the authorities might accuse you of putting it there. We're not so paranoid that having our name and account information embedded in our music bothers us, but if it bothers you, there are at least two simple ways to strip it out.

The easiest method is to convert the tracks to MP3 format from within iTunes. Here's how: Click the Edit menu and choose Preferences. From the drop-down menu labeled "Import Using," choose "MP3 Encoder" and click OK. Select the unprotected track or tracks you wish to convert, click the Advanced menu, and choose "Convert Selection to MP3." If you'd like to convert an entire folder containing unprotected tracks, hold down the Shift key and choose "Convert Selection to MP3." A dialog box will open, enabling you to choose the folder containing the music you'd like to convert. Note: Your original track will remain intact, but this method won't work on protected tracks.

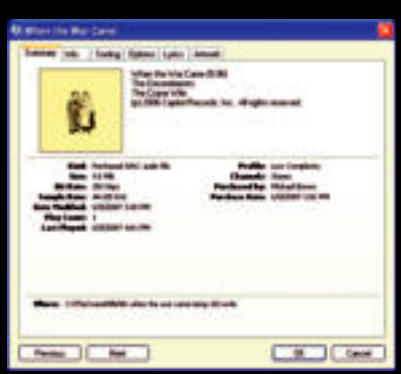
The drawback to the file-conversion approach is that transcoding between the two lossy compression algorithms will likely result in the loss of some audio quality. A better alternative is to manually strip out the data using the freeware utility Atomic Parsley (a Google search will reveal a link). Once you've downloaded and installed the program (uncompress it in the directory containing your music), open a command-line window, navigate to the folder containing the files you wish to alter, and type the following command (replacing "song title.m4a" with your song's name. And be sure to put two hyphens in front of "manual…"):

```
Atomicparsley "song title.m4a"
--manualAtomRemove "moov.udta.meta.
ilst.apID"
```

Atomic Parsley will create a temporary file that doesn't contain the metadata you removed. Import this to iTunes to make sure it plays properly and then back up the original file. When you examine the new track's metadata with iTunes's Get Info command, you'll see it no longer contains your iTunes account name. Of course, crafty Apple may have also placed your info in a less-obvious location.



ITunes will encode your personal name and your iTunes account info into the metadata of each track you purchase on the service.



If you're paranoid about having your iTunes account name in your tracks, you can easily remove it using the utility Atomic Parsley.

Continued from page 54

earn *our* money, it will have to offer DRM-free music encoded in a lossless format.

On the other hand, online distribution is a brilliant solution for breaking the record industry's stranglehold on musicians. Frank Zappa said it best in this monologue recorded in 1978, which his son Dweezil remixed and christened "Drooling Midrange Accountants on Easter Hay" for the 2004 DTS release *QuAUDIOPHILIAc*.

> *"All decisions about who gets signed and what happens to the record are made by these drooling little midrange accountants. And everything is based on the numbers games in there. And the taste of the accountants is what is ruling the mass media. It's all just the dollars and cents of exchange. And if you wanna make music that you believe in, the chances of doing it on a major-label basis are nil, because they're all so frightened."*

Zappa didn't live to see the revolution that's happening in music distribution today, but we're sure he would have cheered it on because the major labels are becoming increasingly irrelevant. The Internet has broken down that monolithic barrier that prevented musicians from exposing their works to a large audience. The record industry is more frightened than ever, and as a result, we no longer have to suffer for it. (See the sidebar "Other DRM-Free Music Outlets" for some of our favorite music sources.)

TRACK RESULTS **BREAKDOWN**

ARTIST	TRACK	PICKED HIGH BITRATE TRACK WITH APPLE EARPHONES?	PICKED HIGH BITRATE TRACK WITH SHURE EARPHONES?
NINE INCH NAILS	The Great Destroyer	**Yes**	No
TEA LEAF GREEN	If it Wasn't for the Money	No	No
GUNS N' ROSES	Use Your Illusion II	**Yes**	**Yes**
HÜSKER DÜ	Celebrated Summer	**Yes**	No
MASSIVE ATTACK	Future Proof	**Yes**	No
STEVIE WONDER	Sir Duke	No	**Yes**
MINGUS BIG BAND	Jump Monk	**Yes**	**Yes**
SUNDAY'S BEST	Truest You	**Yes**	**Yes**
ANDRES SEGOVIA	Chaconne (from Violin Partita No. 2)	**Yes**	**Yes**
STEELY DAN	Josie	**Yes**	**Yes**

OTHER DRM-FREE MUSIC OUTLETS

We're encouraged by the growing number of music stores that are willing to trust paying consumers

Apple and EMI aren't the only sources of DRM-free music; in fact, they're not even the first, but they are the biggest. EMI hasn't limited itself to a partnership with Apple; the company has also signed deals with Amazon and PassAlong Networks (www.passalongnetworks.com). Amazon, the 800-pound gorilla of e-tailing, will soon begin selling digital music in MP3 format. PassAlong Networks doesn't sell music directly to the public; it offers a download infrastructure product known as StoreBlocks to retailers such as FYE, which will then sell unprotected 320Kb/s MP3s to the public.

EMusic (www.emusic.com) is an old hand at selling DRM-free MP3s, and it's one of our favorite sources for new music. This online service offers tracks encoded in MP3 format at bitrates of 192Kb/s VBR from a variety of independent labels. You can transfer the tracks to any player, burn them to CD as many times as you'd like, and make as many copies as you'd like (provided, of course, that the copies are for private use).

EMusic is a subscription service: You pay $10 per month to download 30 songs, $15 per month to download 50 songs, and $20 per month to download 75 songs (unused downloads do not roll over). If you want to purchase more music in a particular month without upgrading your subscription, you can purchase a Booster Pack.

Don't like being tied to a monthly subscription? Audio Lunchbox (www.audiolunchbox.com) offers a pay-as-you-go plan ($1 per track) in addition to its subscription model of $10 per month for 40 "credits" (songs typically sell for one credit each), $25 per month for 125 credits, and so on.

Don't like being tied to a subscription plan? Audio Lunchbox offers an à la carte plan, too.

Amie Street (www.amiestreet.com) also specializes in offering DRM-free music from independent artists. This site doesn't charge a membership fee and also gives away much of its new music for free. Music is sold on a sliding scale based on how popular a song is: Free songs are new or haven't caught on with a wide audience. As a song gains a foothold in the market by racking up downloads, its price rises to a maximum of 98 cents.

Magnatune (www.magnatune.com) is a combo record label and music merchant that lets you listen to all the music from its entire stable of artists for free. If you hear something you like, you can download the album—but you decide how much to pay (with a $5 floor and an $18 ceiling). What's even cooler is that you can also choose the format in which the music is encoded, ranging from MP3 to FLAC or even WAV. This is the most unique business model we've seen in the music industry.

MusicGiants (www.musicgiants.com), our favorite source for high-bitrate tracks from established artists, has so far only dipped its toe in the DRM-free market: It's offering Paul McCartney's new album, *Memory Almost Full*, encoded in WMA Lossless format for $1.29 per track or $15.29 for the entire album. MPC

Maintain Your Water-Cooling Setup

Drain, disassemble, and clean your water-cooling kit—then put it all back together in the time it takes to watch a non-*LOTR* movie!

TIME 02:00 HOURS:MINUTES

Water-cooling your PC is an exercise in trade-offs. What you gain in performance and overall geek cred by attaching tubes and water blocks to your pricey parts, you lose in time devoted to maintenance. Unlike an air cooler, which needs only a good blast of compressed air every now and then, a water-cooling rig demands a bit of attention over the course of a year. We're not talking about new-puppy-level time commitments, but be prepared to spend a few days a year performing some basic maintenance tasks.

What happens if you just sit back and ignore your computer's cooling? Get ready for gunked-up water blocks, murky tubes, and decreased performance. But taking care of your water-cooling system isn't as difficult as you might think. For your cleaning convenience, here's what you need to do to maintain your setup.

BY DAVE **MURPHY**

WHAT YOU NEED

- PAPER TOWELS
- VINEGAR
- TOOTHBRUSH
- DISTILLED WATER
- RIFLE-CLEANING ROD

1 Draining the Fluid Without Staining Your Floor

This one should be obvious: You'll never be able to get any maintenance done on your water-cooled rig unless you get the fluid out of the rig's tubes. But thanks to the wonders of air pressure, draining a water-cooling setup isn't too complicated.

You want to hold one of the tubes nice and high in the air, with a tube at the other end of your setup as low to the ground as possible and preferably going into a bottle, jug, or bucket of some sort. Obviously, liquid is going to start coming out of the tube the moment you tilt it downward, and once you get the opposing tube into the air, your rig will magically drain itself—sort of.

If your water-cooling setup is entirely closed (that is, it uses only a T-line, or for the truly bold, nothing), then draining it is even easier. Air pressure should take care of most of the liquid, but if you're impatient, you can just wrap your hand around the free tube and blow, blow, blow. Try not to get any coolant in your mouth.

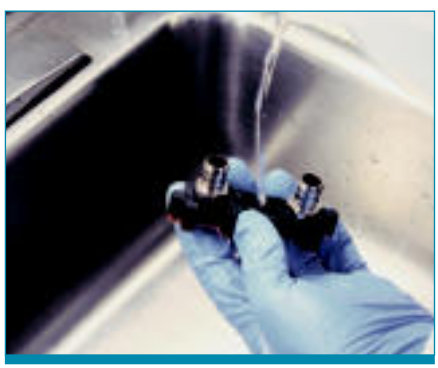
Reservoir setups are a bit more finicky since the liquid in them will drain from your kit only until it falls below the output hole of the reservoir. Blowing will do you little good at that point, so you'll need to physically tilt your case in order to get the liquid out of the reservoir. Of course, you could always just remove the reservoir, but be sure to watch out for drips while removing the tubes!

If you can't drain your rig using the air-pressure method, you'll have to start by dumping the reservoir.

2 Cleaning Your Kit

If you just want to spot-clean your rig, first get a container of hot water. You'll be turning it into a reservoir of sorts by dipping the tubes into the container so that the hot water is sucked through your rig and then spit back into the same container. If you want to get really fancy, use a separate container for the gunky output portion of the cleaning; using this method, you'll still want to run the hot water through your system for a good amount of time—30 minutes to an hour.

For truly filthy rigs, or truly dedicated water-cooling aficionados, a complete kit disassembly is in order. Once you've got your parts laid out, you can start scrubbing. Depending on the condition of your tubing (and potential coolant-staining issues), you might just want to start over with brand-new plastic pipes (street price: $4). But if you insist on keeping your current gear, head down to your local gun shop and pick up a rifle-cleaning rod. A little warm, soapy water or vinegar and some brisk scrubbing will clean your pipes but good. Rinse and then run some distilled water through your tubes.

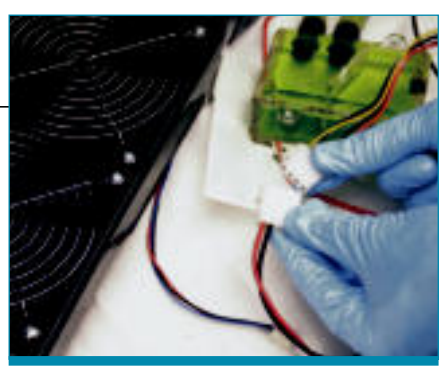


Don't forget to rinse everything with distilled water as the last step in your cleaning process!

For the deepest clean possible, take apart your water blocks. Be advised that doing this will likely void their warranty, but it's a small price to pay for shiny, residue-free cooling accessories. Grab a toothbrush and some vinegar and apply a thorough helping of elbow grease. Don't forget to give the parts a good rinse in hot water when you're done. Next, rinse them with distilled water or you'll completely invalidate the wonderful cleaning job you just did. Reassemble your blocks, and you will have successfully completed your cleaning duties for the day; provided your blocks don't leak, that is….

3 Towel Testing

There's nothing more annoying than spending hours getting the perfect water-cooling system installed in your machine only to see the fateful drip, drip of a leaky connection after you've started adding coolant. Sure, you can make some last-minute adjustments to a water-cooling rig once it's in your case, but it's cumbersome. And depending on the severity of your leak, it could be a race against the clock.



If you spring a leak, it might be in your best interest to unplug the power supply before you get to tinkering.

You can avoid drippy disasters entirely by assembling your water-cooling rig outside of your case to begin with. Admittedly, this will do nothing to prevent user error in the installation process, but it *will* help you quickly diagnose problems with connections, tubing, and anything else that could possibly go wrong with your setup.

Spread out a couple paper towels and set your entire water-cooling rig on your makeshift leak-testing station. Jump a power supply by jamming one end of a paper clip in the 20- or 24-pin green connector and the other end in a black connector, but make sure the power supply is unplugged. Before you plug the power supply into the wall, rig up your pump and

a few fans—you need to draw a bit of juice or your power supply will burn out.

That's it! But don't consider yourself finished just because your kit didn't start shooting water. Let it run for a bit—a full day, if you're patient. Trust us, it's a lot better to find leaks *before* they have a chance to drip all over your expensive computer parts.

4 Fill It Up

You've cleaned your kit, checked it for leaks, and are now ready to take the final plunge and stick your water-cooling gear back into your system for good. Filling a water-cooling system is simple, but there are still a few ways to ensure that it's a smooth, spill-free process.

There's little more embarrassing than surviving the entire maintenance process only to spill a ton of liquid because you weren't paying attention when filling.

If you're using a reservoir, just pour your liquid of choice into the bay, sit back, and let the magic happen. As soon as you see some water coming through the output of your pump, it should be safe to turn on the system and let your pump do the work for you. Just be sure to keep the reservoir filled.

For those who are cooling sans reservoir, it's a similar process, but pour the coolant slowly into your T-line; we've often found ourselves daydreaming during a steady pour, only to end up with coolant all over the place after misjudging the overall flow rate of the water-cooling setup. However, one benefit of using a T-line is that you can take a little more time to fill the machine before turning it on. Just use the same trick as before, in which you hold the T-line as high as you can when filling it, letting air pressure push the fluid through your system for you.

5 Bursting Your Bubbles

Wait! What's that? Your fluid isn't chugging around as fast as you think it should, and you're seeing a lot of air bubbles churn through your tubes? Well, these problems are related. The air traveling through your pipes impedes the performance of your water-cooling setup, but fear not. It happens every time you install a water-cooling unit, and it's easy to fix.

If you have a reservoir, just pop off the cap and let your machine run. The bubbles will make their way back into your reservoir and happily escape into the atmosphere. Let your rig run for a few hours (or overnight), and all the trapped air will be gone. T-line users will find the process a bit more tedious, but you can always tape the line to the side of your case. Just be sure it's up high to discourage any fluid from making an appearance on your floor.

Bubbles impede your pump's ability to... pump. Nix the bubbles to increase performance.

how2mini

Sprung a leak? Totally stuck with your installation? Need a quick read while your kit debubbles? Here are some tips to help you achieve maximum water-cooling awesomeness.

1. DON'T HULK UP

Tightening the fittings for your water blocks or radiators doesn't require a Herculean effort. Resist the twisting temptation and you'll be rewarded with a leak-free setup. The bolts should be hand-tightened; torquing them more than that only damages the block and rubber fittings.

2. HOT! HOT! HOT!

Putting 1/2-inch tubing on a 1/2-inch fitting is tough enough. Jamming 3/8-inch tubing on a 1/2-inch fitting is nigh impossible without the help of some hot water. Boil up some water and stick your tubing into the steaming mix for a few seconds. You'll find the fitting process much easier.

3. CHECK YOUR LEVELS

You know what fluids do? They evaporate. Check your levels once a month and fill up your rig as need be. There's no point in water cooling if you don't have enough liquid running through your pipes.

4. DON'T GET KINKY

The best water-cooling setups maintain as short a distance as possible between cooling points—such as the CPU and the videocard, for example. But give yourself enough wiggle room so that you don't create any kinks in the tube. Crimping and pinching only hurts your overall water flow, which reduces the cooling potential of your rig. MPC

Ask the Doctor

Diagnosing and curing your PC problems

AGP PLZ

I recently read your article on 19 awesome upgrades (June 2007), which included a section on AGP upgrades.

In the article, you stated that the best Nvidia card for AGP customers is the GeForce 7800 GS. XFX has since released both a GeForce 7900 GS and a 7950 GT. Do you still recommend the Radeon card for a final AGP upgrade? I am running an Abit AI7 Rev. A2 mobo with a 3GHz Pentium 4 CPU, 1GB of DDR400 RAM, and an XFX GeForce FX 5600 videocard. I would like to extend the life of this computer as long as possible because I will be building a new system from the ground up when this one is no longer useful.

—Franklin Dilly

The GeForce 7950 GT wasn't available in an AGP configuration when we wrote that feature, so I can't speak from hands-on experience. I can tell you that PCI Express cards based on the 7950 GT have been faster than those based on the X1950 Pro. If you can afford to wait, however, you might want to see if AMD releases an AGP version of the Radeon HD 2900 XT. ATI has aggressively supported the older bus architecture. The company hasn't announced plans to come up with such a beast but hasn't ruled it out either.

NEED FOR SPEED

I recently bought a VisionTek X1300 XT. The box said that the card ran at 500MHz, but when I used ATI's Catalyst Control Center, it showed the card was running at 601MHz. I am wondering if Catalyst is displaying the correct data.

—Cameron J.

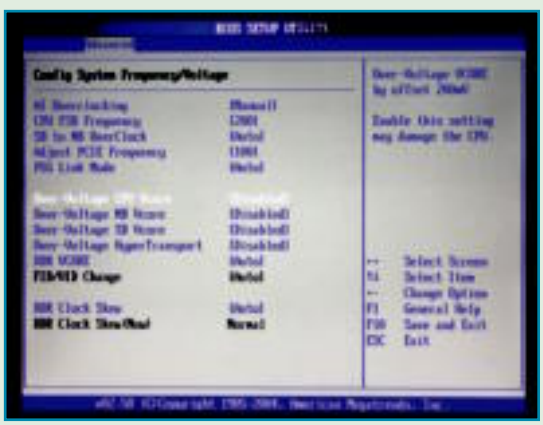
VisionTek bills its Radeon X1300 XT as running at a core clock speed of 500MHz; I doubt it overclocked the card. The Catalyst Control Center user interface is a bit confusing when it comes to figuring out what speed the GPU is actually running at. You'll see four numbers under the heading GPU Status: Requested, Current, one number at the top of a slider control, and another below it.

The Current number shows the clock speed at which the GPU is currently running. If you're not running any benchmarks, this number will be low because the videocard's driver throttles the GPU down to save power and reduce fan noise. The Requested number shows the speed at which the GPU will run when it is under load.

The numbers above and below the slider show the minimum and maximum potential clock speeds. If you unlock the GPU using Overdrive, you can move this slider up and down and test various clock speeds. You should be aware that unlocking the GPU can potentially void your warranty, so tread carefully.

TWEAKIN' THE JUICE

A few months ago, I purchased an EVGA 601 motherboard. I also bought two EVGA 8800 GTX cards and run them in SLI (sometimes). To round out my personal Dream Machine, I have 2GB of Crucial Ballistix PC 8000 RAM (running at 1,000MHz) and an e6600 processor overclocked to 3.5GHz.



When you overclock, you'll likely need to increase the voltage a little bit, but do so in small increments; anything drastic might smoke your parts!

I had bought some Dominator 2x memory, only to have POST problems. Crucial memory worked best, or so I thought. It eventually died. I RMA'd the memory and motherboard, but when I got new parts the PC was unstable. I then tried "tweaking" it. I eventually found that I needed to set the voltages manually. Once I did that, I had no problems whatsoever. Any ideas if this makes sense?

—Brian Thompson

Overclocking is fun, but there are risks, and it sounds like you ran right into them. While automatic overclocking can work sometimes, most people get the best results by setting everything by hand. Taking your proc from 2.4GHz to 3.5GHz would generally mean you need more voltage, and usually it needs to be set manually. As always, remember that overclocking does have its risks, including the possibility of blowing up your CPU, motherboard, or other components.

TWO CORES OF I LOVE YOU

*I love **Maximum PC!** About 20 percent of the content I understand, but no other magazine helps me understand computers and applications like **MPC**. Keep it coming!*

Recently, I gave my wife my four-year-old Gateway 400VTX with a 1,792MHz x86 processor. I upgraded to a new computer with XP Media Center Edition and installed my 2003 Office Pro software. My Gateway MX 6960 has a dual-core Duo T5600 with 1GB of RAM. The improvement has not been that impressive. Question: Do I need a better processor than the one I bought? Do I need to do something to better utilize the dual cores? I use Publisher, PowerPoint, Office, and large server-based systems for real estate and property records. I give presentations and have two websites. What do you think?

—Art Hudson

Your old notebook PC had either a Celeron or Pentium 4—both are dogs compared to the 1.83GHz Core Duo T5600 in your new machine. In almost every application, the Core Duo should be significantly faster than a low-clocked P4 or a P4-based Celeron CPU.

The applications you use would hardly push a dual-core CPU though. Your problem may relate to spindle speeds. If your old notebook used a 7,200RPM drive but your new box uses a 4,200RPM hard drive, you may be confusing the sluggish hard drive for poor processor performance. Try running multiple apps at once. Your dual core should be much faster at doing two or more CPU-intensive tasks, such as watching TV and encoding a video, than an old P4. The Doc thinks you made the right decision by giving away your old box. MPC

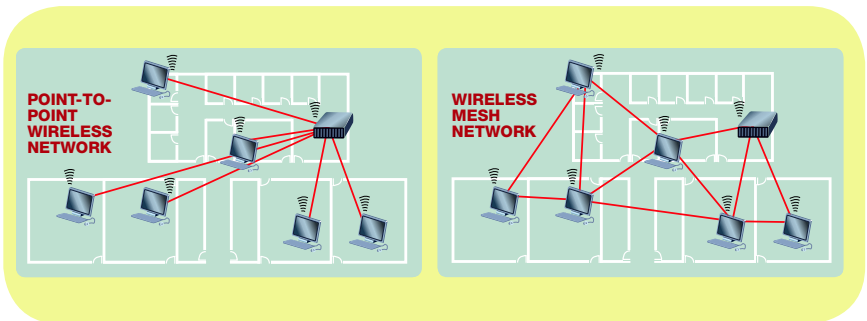
Ding, doctor's done. Ding, doctor's done. Ding, doctor's done. Ding, doctor's done. Troubleshooting fun. Troubleshooting fun. Troubleshooting fun. Troubleshooting fun. I work at *Maximum PC*, answer all your questions, if you email them: **doctor@maximumpc.com**, **doctor@maximumpc.com**. Ding, doctor's done. Ding, doctor's done. Ding, doctor's done. Ding, doctor's done. He's solving all of your problems...

White Paper: Mesh Networking

Decentralized mesh networks are spreading across the globe like kudzu—but their impact is much more beneficial.

BY GORD **GOBLE**

HOW THEY WORK **Point-to-point wireless vs. mesh networks**



In a point-to-point network (left), a central hub services all the nodes in the network. In order for one node to communicate with another, data must first travel to the hub and then from the hub to its final destination. In a mesh network (right), data can travel between nodes without first having to return to the server. Mesh networks can cover much larger areas than point-to-point networks because each node can act as a relay station.

Data networks enable millions of devices to share and exchange data and break down complex problems into bite-size chunks. But the term "network" is a mighty big umbrella covering a number of topologies, including peer-to-peer, Token Ring, client-server, and Star. We're going to focus on one of the newest varieties: the mesh network.

Although it's garnering a lot of attention in today's market, thanks to several novel wireless products, the basic tenets of mesh networking have been around for some time. In the early 1990s, the U.S. military identified a need for a secure wireless broadband data network that could function on the battlefield, where little infrastructure existed. Such a network had to be able to be set up quickly, expand automatically whenever new devices were granted access to the system, and allow extended distance between wired connections. This idea of an ad hoc peer-to-peer network forms the basis for today's mesh network technology.

TEACHING OLD NODES NEW TRICKS

The key difference between a mesh network and the more familiar point-to-point wireless network is that each node in a mesh network can act as a self-contained relay station. This contrasts with a point-to-point topology, in which information flows from a central hub out along spokes to isolated nodes. In such an arrangement, routing information is confined to the central hub, which limits how far any single node can be deployed. Position a node too far from the hub, and it will lose its connection to the network.

Mesh networks are more decentralized. Every node is connected to every other node, with each one capable of behaving as a relay station; information passes from one node to the next until it reaches its ultimate destination. This not only allows for much larger networks covering greater areas but also enables the network to heal itself if one or more nodes becomes incapacitated.

In addition to being self-healing, mesh networks can be self-forming, meaning that nodes can automatically discover one another and link up when they're within range. In this way, a mesh network can expand without human input—simply introduce a node to the coverage area and both the network and its coverage expand.

Mesh networks can be either wireless or wired—in fact, the world's largest network, the Internet, is itself a mesh network. Most smaller-scale deployments, however, are of the wireless variety. Building a wired mesh network with just five nodes, for instance, requires 20 hardwired links in order to connect every node directly to every other node. Building a hardwired partial-mesh network, in which direct connections exist only between the nodes that exchange the most data, would still require an enormous amount of cable.

COMMERCIAL APPLICATIONS

You'll find mesh-networking concepts deployed in a variety of tech products. The Sonos Digital Music System is an easy-to-deploy audio system that uses mesh networking to stream music to multiple rooms within a home. Hardwire one ZonePlayer to your LAN, and it will stream music to as many as 31 other ZonePlayers. The hardwired unit tags each stream with information about which location it's intended for and broadcasts it to every unit within range. Each unit that receives the stream examines the data and plays it if it's the intended target or passes it on to the next node within range if it's not.

The competing home-automation protocols, ZigBee (IEEE 802.15.4) and Z-Wave (proprietary to Zensys, Inc., but broadly licensed), operate in a similar fashion. Products using these technologies have been deployed for lighting control, home security, access control, and many similar applications. Z-Wave networks are based on low-power radio transceivers installed in dimmers, switches, garage-door openers, remote controls, and other devices.

When a command is issued from a remote control in the bedroom to turn on a light in the backyard, it hops from one Z-Wave device to the next until it reaches its destination. If the network determines that the most direct path is blocked—by a stainless-steel refrigerator in the kitchen, for example—it will automatically map an alternate path to its destination. When the targeted light switch receives its command, it turns on the light and sends an acknowledgement back down the same path to the remote.

MIT's Roofnet project applies mesh networking to the 802.11b/g protocol in an effort to extend wireless broadband Internet access across the city of Cambridge, Massachusetts. The project deploys Wi-Fi antennas on rooftops to extend and share a single broadband

connection. Members of the Roofnet team recently formed a startup venture, Meraki Networks, to commercialize this concept. Meraki markets indoor and outdoor repeaters that enable entire neighborhoods to share a single broadband connection. The company offers a solar-powered outdoor repeater, which is particularly appropriate for emerging markets where electricity is scarce or unreliable.

Earthlink is in the midst of deploying a commercial Wi-Fi mesh network in the city of Philadelphia. Its project is designed to create a massive network covering 135 square miles and will offer qualifying low-income households broadband Internet access at discounted rates of just $10 per month. Other subscribers will pay $20 per month. No-cost access is offered in Philadelphia city parks.

The automobile industry is getting in on the mesh-networking act, too. European automakers such as Audi, BMW, DaimlerChrysler, and Volkswagen have formed the Car 2 Car Communication Consortium to explore using mesh-networking concepts to facilitate inter-vehicle communication. The idea is to adapt the 802.11 protocol to enable two or more vehicles to form an ad hoc network as soon as they are within range of each other. Every car would function as a router, passing along messages regarding weather and traffic conditions. Each car relays what it knows about current road conditions to the car closest to it, so if an accident or congestion occurs, this information can bounce down the highway to unaffected drivers who can then take a different route to avoid the problem.

HUMANITARIAN APPLICATIONS

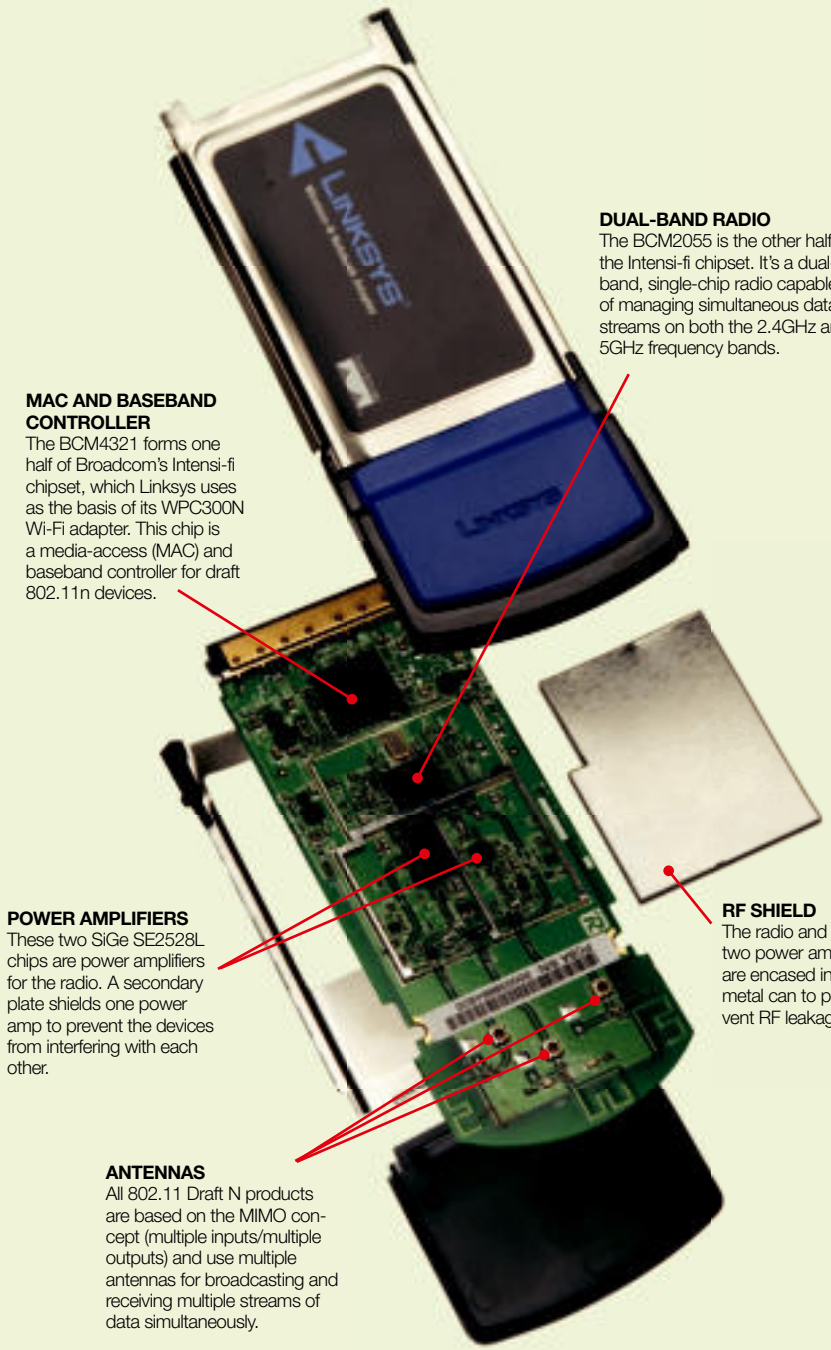
The One Laptop Per Child project, which is working to fabricate a $100 laptop computer that can be distributed to children in developing nations, has tapped mesh networking as its solution for inexpensive Internet access in underserved markets.

Members of OLPC believe that building schools and training teachers is the slowest way to educate children in the rural areas of developing nations. It would be far more efficient, they say, to help children educate themselves and each other by providing them with access to simple technology and the Internet. The current design for the group's XO laptop includes a Wi-Fi module (based on the 802.11b/g standard) that can operate as a mesh point even when the computer's primary CPU is shut off. The mesh routing protocol is based on the 802.11s standard being developed by the IEEE's 802.11 Task Group S.

Mesh networks are decentralized, self-healing, highly adaptive, and supremely resilient. Is it any wonder they're now becoming pervasive? MPC

Draft N Wi-Fi Adapter

The battle to establish an IEEE 802.11n standard for wireless networking is finally drawing to a close. Now that the Wi-Fi Alliance is certifying interoperability among Draft N products, we thought it was time to peel one open.



Any requests? What hardware—new or old—would you like to see go under *Maximum PC*'s autopsy knife? Email your suggestions to **input@maximumpc.com.**

GORDON **MAH UNG**

Thinks PCs Are Like Race Cars

Even after 10 Dream Machine builds, they never get easier

All the hard work, skinned knuckles, and sleepless nights are forgotten when your race car hits the track.

In my youth, I had the opportunity to crew a few "race" cars. The races were strictly at the amateur club level and the cars were far, far away from what's being built for today's pros, but it was still a hell of a good time for a kid.

Which brings me to the subject of the Dream Machine and what it's like to be involved with the project every year. Designing and building a top-class rig is a lot like building a race car, minus the bad track hot dogs and constant noise.

The Dream Machine has to be competitive as both a gaming rig and general-purpose PC. It's not a server nor is it designed for the living room—and it's definitely not grandma friendly. Our lap times are our benchmark scores and the competition is the stable of machines we've reviewed from the pros, companies like Falcon Northwest, Dell, and Voodoo.

I subjected our rig to the same rules that we hold vendors' machines to. We've been hard-asses on unstable overclocked machines, and I held DM '07 to the same high standard. Even though I could boot and benchmark our machine at 4GHz, it wouldn't pass the stability tests we run on every system we review, so I cranked down the clocks. At 3.66GHz, I'm confident this rig is solid.

Another reason the Dream Machine reminds me of my racing days is the sinking feeling I get when something goes wrong. It's inevitable, a critical wire will be too short, a water block will be in the way of an expansion slot, or the OS will be just plain incompatible with the hardware in some unexpected way.

After killing a motherboard this year, I had to do a last-minute rebuild to swap it out and redo the plumbing, hours before the rig's big photo shoot. I had to rebuild, bench, and beautify the Dream Machine before it could be photographed, reminding me of the time we had to swap an engine out of our car in the half hour between qualifying and racing. The Lab was a mess of screws, coolant, and zip ties, but when the hard drives spooled up, the coolant gurgled, and the rig booted into Windows, I felt the same sense of pride and accomplishment I did when I pushed that race car onto the grid.

Michael Brown

Tests A/V Streamers

And concludes that wireless HD-video streaming is a phantom feature

I reviewed Netgear's awesome Digital Entertainer HD EVA8000 and MediaGate's schizophrenic MG-350HD (it's a NAS box! No, it's a streamer!) for this issue. Both devices claim to be able to wirelessly stream high-definition video at resolutions up to 1080p, but neither is really capable of delivering it without the use of CAT5 cable. The 802.11g standard just doesn't have the bandwidth for the task.

But here's an even bigger problem: getting HD content onto your hard drive in the first place. It's a massive pain in the butt. There's no simple way to convert Hollywood movies released in the Blu-ray or HD DVD formats into an easily streamable format, and you still have to break the Digital Millennium Copyright Act when you bypass the disc's encryption. But since neither of these streamers is capable of reading the resulting files and software capable of transcoding those files doesn't exist, all you gain is the ability to watch the movie on whatever monitor is directly connected to your PC (whether the monitor supports HDCP or not).

A recent study by the Consumer Electronics Association claims that 36 percent of U.S. households will have a high-definition TV by the end of this year. If I'm getting HD video delivered from cable or satellite TV services and I'm producing my own high-def content with an HD camcorder, why would I ever be satisfied with watching standard-definition video streamed from my PC?

As excited as I am about having a central home-entertainment server, I don't think the concept will ever gain traction until the problem of streaming HD content is solved.

How We Test

Real-world benchmarks. Real-world results

Computer performance used to be measured with synthetic tests that had little or no bearing on real-world performance. Even worse, when hardware vendors started tailoring their drivers for these synthetic tests, the performance in actual games and applications sometimes dropped.

At *Maximum PC,* our mantra for testing has always been "real world." We use tests that reflect tasks power users perform every single day. With that in mind, here are the six benchmarks we use to test every system we review.

SYSmark2004 SE: This is an update of the SYSmark2004 benchmark, which uses a suite of such common applications as Microsoft Word, Excel, PowerPoint, Macromedia Dreamweaver, Flash, and Winzip to test general performance. It isn't heavy in multithreading, but it does feature multitasking tests.

Adobe Premiere Pro 2.0: We finally ditched our old standard-def Premiere test for one that uses high-def source material. The test is multithreaded, uses the GPU for transitions, and is brutal. It takes about an hour on our zero-point to render a short two-minute, 46-second benchmark movie in the program.

Adobe Photoshop CS2: We start with a RAW photo shot with a Canon EOS 20D, and apply a crapload of filters and other tasks from CS2 to see just how fast a rig can chew through the workload. Because we use every filter we can, the test is more fair and balanced than the usual cherry picking of Photoshop tests.

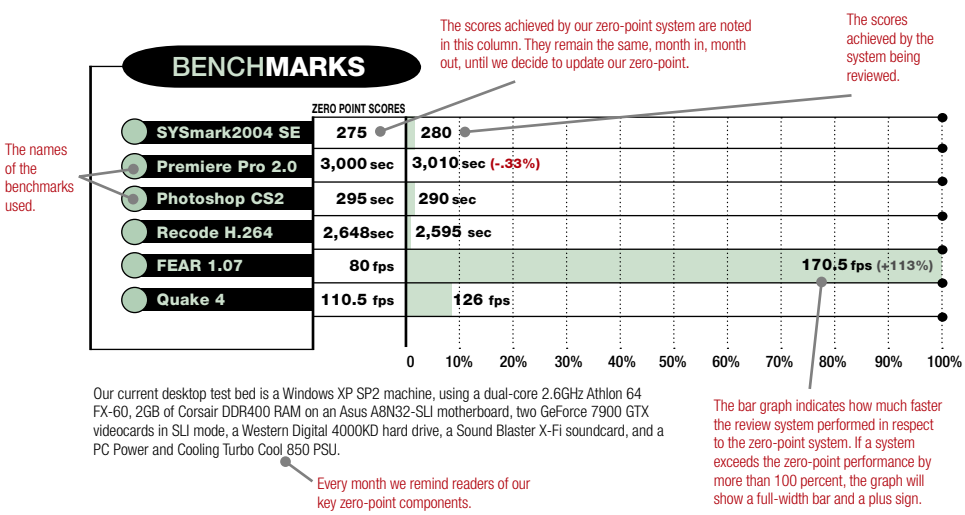
Ahead Nero Recode 2.0: Nero Recode 2.0 is one of the fastest video-transcoding utilities. We copy unencrypted VOB files to the hard drive, then convert the movie to an H.264 file formatted for the Apple iPod's screen. The version included with Nero 7.5, is the only multithreaded H.264 encoder we've found thus far and is optimized for dual-core CPUs.

Quake 4: Based on the Doom 3 engine, Quake 4 is a popular OpenGL game. We run our test at 1600x1200 with 4x antialiasing and 4x anisotropic filtering. Generally, more robust OpenGL drivers yield better performance. We use a custom timedemo recorded using the 1.2 patch, which supports Hyper-Threading and dual-core processors.

FEAR: Monolith's FEAR is a cutting-edge DirectX game that pushes PCs and graphics hardware to the limit. We run FEAR at 1600x1200 with soft shadows, physics, and audio acceleration enabled, using the 1.07 patch.

How to Read Our Benchmark Chart

Maximum PC's test beds double as zero-point systems, against which all review systems are compared. Here's how to read our benchmark chart.



BEST OF THE BEST

Our monthly category-by-category list of our favorite products. New products are in red.

High-end videocard
XFX GeForce 8800 Ultra

Midrange videocard
PowerColor HD HD2900 XT 512MB DDR3

Soundcard
Creative Labs X-Fi XtremeGamer Fatal1ty Pro Series
The XtremeGamer is the kissing cousin of our previous favorite, but with additional onboard memory.

Hard drive
Hitachi Deskstar 7K1000

External backup drive
Western Digital My Book Pro II

High-def burner
LG GGW-H10N
LG's all-in-one 4x Blu-ray burner, HD DVD reader, and DVD/CD burner lives up to its "multi" moniker.

DVD burner
Plextor PX-755SA

High-end LCD monitor
Dell 2707WFP

Budget LCD monitor
Samsung SyncMaster 206BW

Socket AM2 Athlon 64 mobo
Gigabyte GA-M59SLI-S5

Socket 775 Core 2 Duo mobo
Asus Striker Extreme

HD-based MP3 player
Apple iPod

Flash-based MP3 player
SanDisk Sansa Connect 4GB

5.1 speakers
Gigaworks S750
With a big, booming sub and plenty of power, the Cambridge SoundWorks–designed S750s are the new king of the speaker heap.

2.0 speakers
Audioengine 5

Midtower case
Antec Nine Hundred

Full-tower case
Gigabyte 3D Aurora 570

Games we are playing
Shadowrun, Halo 2, Quake Wars Beta, Desert Conflict, UT2004, Fallout

Samsung Q1 Ultra

We love the concept of a pint-size, full-featured PC, but this one's not yet ready for prime time

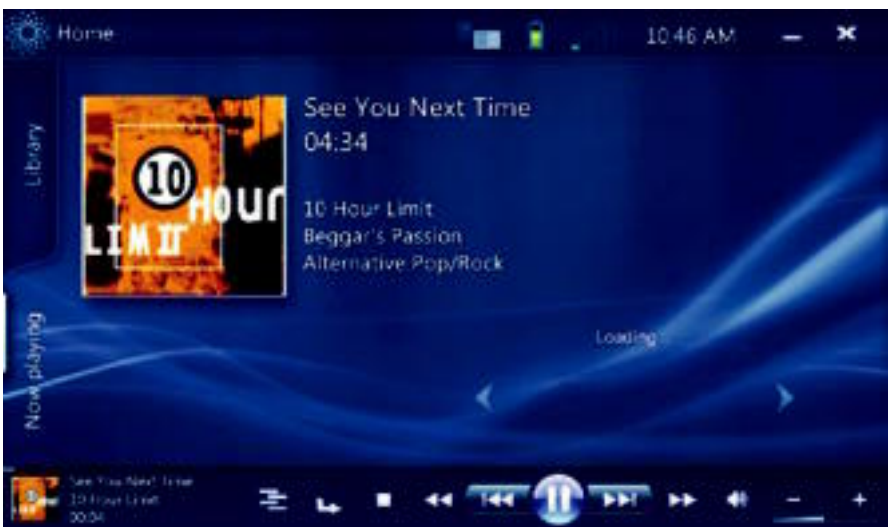
Samsung's newest Origami device adds a cell-phone-style keyboard, which is an improvement over the keyboardless first-gen hardware.

Microsoft created a ton of fuss with the launch of a version of Windows tuned for palmtops and other keyboardless PCs. But the devices that utilized it—code-named Origami—couldn't live up to the prelaunch hype. The initial Windows XP–powered Ultra-Mobile PCs (UMPCs) suffered from a tacked-on user interface, goofy or unusable input mechanisms, poor performance, and an absurdly high price. Although Samsung's second-gen Q1 Ultra fixes some of these problems, many others remain.

The fundamental issue is input. Although UMPC devices include touch screens and a pimped-out version of Vista's Tablet PC support, the Windows user interface simply isn't finger friendly. People's fingers just aren't pointy enough to accurately press a standard Windows-size button. While the UMPC version of Vista includes a couple of apps that are designed to work with fingers on the touch screen, those apps let you play media—but not control the vast majority of tasks that you'd use a PC this size for. The addition of a keyboard is a good decision, but the buttons are smaller than those on most smartphones. They're simply too small to press easily without peeking at them. Worse, sometimes pressing the proper buttons results in random characters appearing onscreen. Boo! Hiss!

This leads us to the big question—what would one use an Ultra-Mobile PC for? Although the formfactor is perfect for watching video in a car or on a plane, the CPU and integrated graphics are serious underperformers, rendering the device incapable of playing even standard-definition video captured using a cheap point-and-shoot camera. The screen would be perfect for photo viewing, but insufficient system memory and a very slow hard drive make photo renders run extremely slowly, especially with high-resolution photos.

We do dig the front-mounted video-conferencing camera. At .3MP, it's very low resolution, but it is more than enough for quick Skype videoconferences.



The Origami Experience is the finger-friendly front end for the UMPC, but it leaves a lot to be desired for folks looking to actually use the little machine.

SPECS

CPU	Intel Ultra Mobile Processor A110 (800MHz)
MEMORY	1GB DDR2 400MHz
GPU	Intel GMA950 w/128MB shared
DISPLAY	7-inch touch-screen LCD, 1024x600 native resolution
STORAGE	60GB 1.8-inch, 4,200RPM hard drive
EXTRAS	Front-facing video-chat camera, 1.3MP still cam, integrated SD card reader, dual-array microphone

The integrated mic worked well, picking up our conversation without a ton of background noise, even in a noisy airport environment. However, the 1.3MP camera on the other side of the device feels like an afterthought. It's roughly equivalent to what you'd find in a typical cameraphone, but the UMPC lacks the always-on convenience of a phone cam.

Because it lacks a full-size keyboard, the UMPC won't be replacing our business laptop. We can imagine a ton of uses for a rig like this in industrial settings, but the software isn't fully baked enough for most

consumers to use. Instead, you'd be better served by a full-blown laptop.

With a 7-inch 1024x600 LED backlit display and a digital pad that's perfect for scrolling pages, the Ultra is a competent web-browsing platform. However, we can't justify spending $1,200 on a machine dedicated solely to web browsing when we can get an actual laptop for a lot less that does everything this machine does, minus the nifty touchscreen functions.

The hardware is designed to balance battery life and performance. In our tests, the battery lasted between four and six hours, depending on backlight brightness and Wi-Fi usage. We couldn't help but think that the machine could benefit from a little more oomph under the hood, either with a GPU that features dedicated video processing or a little more CPU juice. In its current configuration, it's unlikely that you'll actually be able to watch decent-quality video on this little number.

We remain optimistic that Microsoft and its hardware partners will turn the UMPC tide and deliver a compelling touch-screen experience. There were marked improvements in battery life and input (when using the stylus instead of a finger) with this generation, but we think the Q1 Ultra represents generation 1.5 rather than a true second-generation product.

—WILL SMITH

SAMSUNG Q1 ULTRA

HIGH FIVE

Great screen, good battery life, and improved stylus input.

DOWN LOW

Still bad for the fingers; slow performance in media apps.

6

$1,200, www.samsungusa.com

Heat Pipes Gone Wild!

Intel's hot new P35 goes toe-to-toe with Nvidia's venerable SLI chipset

Friends? Bah! With news that Nvidia has pooh-poohed ever getting SLI on a non-Nvidia chipset, we pitted Nvidia's proud 680i SLI against Intel's upstart, the P35, by comparing Gigabyte's wickedly over-the-top GA-N680SLI-DQ6 and MSI's new P35 Platinum!

—GORDON MAH UNG

Who says a heat pipe has to be boring: Gigabyte's GA-N680SLI-DQ6 (left) and MSI's P35 Platinum (right) let it all hang out with feature-packed boards and heat pipes lifted straight out of Wally World.

MSI P35 PLATINUM

MSI's new motherboard doesn't have a mere heat pipe to wick heat from the chipset and voltage-regulator modules. It has a full-on loop de loop heat ride through the amusement park known as the P35 Platinum. Why include the crazy Circu-Pipe? We don't really know, but it sure does look cool.

The board itself is based on Intel's new P35 chipset (aka Bearlake), so it will work with the next generation of Intel processors. Although there are two x16 PCI-E slots, dual-graphics support is limited to AMD's Radeon parts, as Nvidia still won't unlock any SLI license for non-nForce desktop chipsets.

MSI goes beyond a simple power LED by integrating a multi-LED array that helps you diagnose POST issues. The company did make a few design gaffes though. MSI broke the usual front-panel header array into two rows that are somewhat confusing; they look almost like FireWire or USB headers. Another rookie move: One of the SATA ports will be blocked if you run a double-wide graphics card.

Board layout isn't our major concern with the P35 Platinum though, performance is. Using the same RAM, drivers, and components we used in our last mobo shootout, we found the P35 Platinum lagging in RAM tests by a serious margin. We also saw problems crop up in our Valve Particle test, which is particularly sensitive to RAM latency. Though we suspect a simple BIOS update could fix our problems, we'd rather go with another P35 board for now.

MSI P35 PLATINUM

+ SPACE MOUNTAIN
Guaranteed to work with next-gen Intel CPUs.

− THE GRIZZLY
Some SATA connectors blocked by double-wide GPUs.

7

$185, www.msicomputer.com

GIGABYTE GA-N680SLI-DQ6

Gigabyte cranks up the specsmanship for its GA-N680SLI-DQ6, which offers no fewer than 10 SATA ports and *four* Gigabit Ethernet ports. Yep. Four. What you'd ever need four Ethernet ports for, we don't know.

The N680SLI-DQ6 also sports a honking heat pipe that actually wraps around to the back of the motherboard to a heatsink. Layout FUBARs are kept to a minimum, but some may squawk about the four SATA controllers on the bottom edge that could conflict with running SLI with double-wide cards.

One "feature" we will never understand, however, is Gigabyte's insistence that it hide access to some critical system settings in the BIOS. You can't set the RAM timing simply by going into the BIOS. You have to use the secret CTRL-F1 sequence that isn't documented in the manual. Unless you're Indiana Jones and you stumble on the secret you'll never know it exists. Bah.

Using the same hardware setup we've utilized in our last five motherboard reviews, the Gigabyte was quite speedy in our benchmarks. In our synthetic memory tests, it squeaked past the MSI P6N SLI Platinum (reviewed in July) as well as the two other P35 boards we've tested (reviewed in August). The N680SLI-DQ6's worst performance came in the hard drive section of PCMark05—it came in dead last in disk I/O. That's odd since the 650i chipset in the MSI board sports pretty much the same SATA controller. The board also ran slower than the lesser nForce boards in our Valve Particle test. As we've noted, this test seems more sensitive to latency, which we didn't expect to be a problem since the RAM was manually set for both of the boards. As with the MSI P35 board, a BIOS update may be needed, but overall, performance was quite good.

GIGABYTE GA-N680SLI-DQ6

+ GIANT DIPPER
Craploads of SATA ports; pretty speedy.

− THE MATTERHORN
Realtek audio still doesn't work with EAX.

9

$295, www.gigabyte.com.tw

BENCHMARKS

	MSI	GIGABYTE
CHIPSET	Intel P35	Nvidia nForce 680i SLI
RAM SPEED	DDR2/800	DDR2/800
SISOFT SANDRA XI (MB/S)	6,098	**6,702**
3DMARK2001 SE OVERALL	36,689	**36,781**
3DMARK2003 OVERALL	23,953	**24,051**
3DMARK2005 CPU	**8,670**	8,547
PCMARK05 CPU	**5,997**	5,983
PCMARK05 RAM	5,394	**5,654**
PCMARK05 GPU	8,618	**8,824**
PCMARK05 HD	**6,200**	5,995
VALVE PARTICLE TEST	35	35
FEAR 1.07 (FPS)	**207**	199

Best scores are bolded. For our test, we used a 1.86GHz Core 2 Duo E6300 overclocked to 2.33GHz on a 1,333MHz front-side bus, 2GB of Corsair DDR2 and 2GB of Corsair DDR3, a WD GD740 drive, a GeForce 7900 GTX, a 1KW PC Power and Cooling PSU, and Windows XP Professional. Intel boards were tested with AHCI modes enabled.

24-inch Triumvirate

Authoritative screens for the everyman

Clearly, the LCD sweet spot these days is at 24 inches, where you can get in on the big, wide 1920x1200-resolution action for well under a grand. Your biggest problem will be choosing from the multitude of models. Our current 24-inch fave is Dell's 2407WFP (reviewed September 2006). But let's see how three of its competitors fare.

—KATHERINE STEVENSON

DOUBLESIGHT DS-240WB

DoubleSight is best known for its two-in-one monitor solutions, such as the dual 19-inch display we reviewed in March 2007, but we'll take a single seamless 24-inch screen over that option any day. The DS-240WB looks all business with a simple but sturdy black frame. Its telescoping neck lets you adjust the screen's height, plus you can tilt, pivot, and rotate the screen's orientation. Input options consist of one VGA, one DVI, and one audio input. To access the whole gamut of onscreen

To get the most out of DoubleSight's LCD, you'll need to use the analog interface—that sucks.

display (OSD) options, you'll need to use VGA. For instance, you can adjust the screen's individual color channels and even its overall color tone only with the analog interface; DVI limits you to contrast and brightness changes.

This LCD also favors VGA when it comes to displaying HDCP-encumbered content. But that's only because content producers haven't clamped down on the analog stream—yet. Simply put, this LCD lacks HDCP support, so if movies are important, beware.

Otherwise, the DS-240WB performs well. It aced our Display Mate (**www.displaymate.com**) scripts, it captured the nuances of our high-res digital photos, and it held up to the rigors of action gaming. Still, in our minds it's lacking.

DOUBLESIGHT DS-240WB **7**

$550, www.doublesight.com

GATEWAY FPD2485W

Gateway's 24-inch LCD stands out in this crowd by offering far and away the most input options: VGA and DVI ins are joined by S-video, composite, and two component connectors, as well as four USB 2.0 ports. This LCD, however, also sports *the* most annoying OSD. Menu selections are accompanied by sound effects that are reminiscent of a Casio keyboard's. And while there's a healthy array of menu options to choose from, none appears to disable the menu's audio. Twitchy touch-sensitive OSD buttons certainly don't help matters.

The FPD2485W performed adequately in Display Mate, but the screen did show signs of banding in grayscales of 85 steps or more, particularly at the dark end of the spectrum. We looked for evidence of this shortcoming in our high-res digital photos, concentrating on subtle transitions in shades, but found no apparent flaws. We were also satisfied with the screen's abilities with movies, including those with HDCP, but its game performance was unacceptable. An obvious and persistent flicker and other signs of digital noise seemed indicative of a screen that can't keep up with rapidly changing content. Not good.

GATEWAY FPD2485W **5**

$580, www.gateway.com

NEC MULTISYNC LCD2470WNX

NEC's LCD2470WNX doesn't offer quite as many input options as Gateway's LCD, but it splits the difference between that monitor and the DoubleSight, with VGA, DVI, and four USB 2.0 ports. Like the other LCDs reviewed here, it provides the full range of ergo options—height, tilt, swivel, and rotate. The OSD, for its part, is fairly simple to navigate and includes the same variety of options whether you're using the digital or analog interface. What's more, it doesn't squawk at you.

Gateway's FPD2485W reminds us that not all modern LCDs are up to gaming.

NEC's LCD2470WNX: In this case, you do get more for your money—just not enough.

Like Gateway's screen, the NEC showed some banding in the more extensive grayscales, although to a lesser degree. And since that issue didn't hurt Gateway's real-world performance, it's not surprising that NEC's screen fared well with our sample photos. The LCD2470WNX's built-in HDCP support let us watch high-definition movies on its big screen and its pixel-response performance kept pace with our games, although there was a hint of ghosting in high-contrast areas.

Overall, the LCD2470WNX is nice, but not as nice as Dell's more feature-rich, less expensive 2407WFP.

NEC MULTISYNC LCD2470WNX **8**

$800, www.necdisplay.com

LG GGW-H10NI Super Multi Blue

Blu-ray and HD DVD capabilities in a single drive

Before you get too excited about LG's combo optical drive, bear in mind that while the GGW-H10NI Super Multi Blue can read both Blu-ray and HD DVD discs, it can write to only the former format. Still, this drive offers a degree of flexibility that no other next-gen drive we've tested has. You won't be shut out of watching movies from studios that have allied themselves with just one of the high-def formats. Not surprisingly, this luxury doesn't come cheap. At $1,200, the Super Multi Blue costs more than your average Blu-ray burner—by as much as $600.

But here's something else that makes this drive special: 4x BD-R burns. The other Blu-ray burners we've tested have been capped at 2x speeds when burning to single-layer high-def media. In real-world terms, 4x amounts to a significant time savings. Using LG's drive, we burned 22.5GB of data to our disc in 27:27 (min:sec). Granted, that's hardly speedy, but it's half the time it's taken us with other drives. When burning to rewriteable media (BD-RE), the Super Multi Blue took 45:11 to fill a single-layer disc, while the competition typically takes more than 90 minutes to complete this task. (The exception is the Lite-On LH-2B1S that we reviewed in July, which lacks a data-verification feature commonly employed for BD-RE situations—see chart below.)

With LG's Super Multi Blue, you won't have time to eat a full-course meal while your Blu-ray disc is burning.

Like most of the other Blu-ray burners we've tested, the Super Multi Blue is spec'd for 8x DVD burns. Consequently, it took us 10:09 to write 4.37GB of data to a DVD+R disc. That's not as fast as Lite-On's burner, which is spec'd at 12x, but then again, Lite-On's drive can't hold a candle to LG's BD-R speeds. That fact, combined with this drive's dual-format HD reads and its future-proof SATA interface are the reasons we picked the Super Multi Blue for this year's Dream Machine (see page 24).

—KATHERINE STEVENSON

BENCHMARKS

	LG	LITE-ON
DVD WRITE SPEED AVERAGE	6.67x	**8.95x**
DVD READ SPEED AVERAGE	7.61x	**9.36x**
ACCESS TIME (RANDOM/FULL)	190ms/374ms	**138ms/216ms**
CPU UTILIZATION (8X)	**30%**	31%
TIME TO BURN 22.5GB TO BD-R (MIN:SEC)	**27:27**	46:41
TIME TO BURN 22.5GB TO BD-RE (MIN:SEC)	**45:11**	46:36

Best scores are bolded. All tests were conducted using the latest version of Nero CD-DVD Speed and Verbatim media. Our test bed is a Windows XP SP2 machine using a dual-core 2.6GHz Athlon 64 FX-60, 2GB of Corsair DDR400 RAM on an Asus A8N-SLI motherboard, an ATI X1950 Pro videocard, a Western Digital 4000KD hard drive, and a PC Power and Cooling Turbo Cool 850 PSU.

LG SUPER MULTI BLUE **9**

$1,200, www.lge.com

Time for a Case Race

Looks can be deceiving, sometimes beauty is just skin deep

It's always fun to see the interesting (and sometimes bizarre) design decisions that push a case down the dark or light side of our review scale. Cases being what they are—boxes for your computer parts—it's pretty tough to pinpoint one flaw that will drag a chassis into the mud. It's usually a combination of one major uh-oh and a bunch of minor ughs that leave us searching for better enclosures, as is the "case" with one of this month's contenders. The other, minus its extreme size, impresses us greatly.

—DAVE MURPHY

It's big. It's black. And it's back. Antec's P190 case smoothes out some wrinkles but ever so slightly misses receiving a Kick Ass award.

DYNAPOWER USA HACHIMAN

When Dynapower's Hachiman case hit the Maximum PC Lab, we were immediately taken aback by the coolness of its paint job. We've never been fans of anime, nor do we normally consider a case's aesthetics during a review. That said, the Hachiman definitely gets points for looks. It's not perfect; the paint has a bumpy, orange-peel texture, the decals don't line up, and only half of the case's chassis has a beautiful black undercoat. The other half is standard, butt-ugly gray.

Still, it's a pity that such a nice bit of work on the exterior is completely and totally marred by one of the most unpleasant interiors we've ever seen. Where do we even begin? We'll start with the one good note—the case comes with a 600W power supply, which is a nice little inclusion that spares you from having to buy one yourself.

Stuffing accessories into the front panel of the case requires you to use the Hachiman's flimsy, screwless mounting devices. They work, but not very well. And they're ugly, but that's beside the point. The case's screwless PCI holders function slightly better, but again, we've seen better designs.

The true deal-breaker for us isn't the case's front-panel LCD display—though its blue hue destroys the red aesthetic of the case—but rather, the front-panel connectors themselves. Unlike virtually all the other cases we've seen, which bundle front-panel connectors into an easy-to-connect-to-the-mobo block, the Hachiman case forces you to bust out your motherboard's manual and connect pins one at a time. Weaksauce, Dynapower.

We're still not sure why Dynapower USA decided to match a blue lighting scheme with a bright red case.

DYNAPOWER USA HACHIMAN

HADOKEN
Sweet exterior, marred by the designer's sloppiness in not painting the entire case.

HIBIKI
Manually connecting single pins to single connectors just plain sucks.

4

$150, www.dynapowerusa.com

ANTEC P190

If all the world's computer cases were playing a game of Battlefield, then the Antec P190 would surely be one of the tanks. This thing is a monstrosity of a midtower, though functionally, it differs very little from everything else in Antec's P-series of cases.

However, this case does add improvements we've been dreaming of since we first laid our hands on the P180. The P190 comes with that extra bit of horizontal space that makes all the difference in the world if you rock extra-long videocards. Previous models were just too cramped—even if you weren't using a water-cooling system.

We love how two in-tandem power supplies are included in this beast: a 650W device for your motherboard and cards, and a 550W one for everything else. That said, cable management is still an issue with the P190. To its credit, Antec continues to try to find better ways to route or otherwise minimize the impact of the snarl of cables shooting out of the southern chunk of the case. But the design still feels wrong, especially when you have to route your cables through a tiny rabbit hole, over a fan, and back through a hole just to get to the lower drive bay.

At least the case's airflow is totally unrestricted, thanks to the whirling power of four 12cm fans and a beastly 20cm side-panel fan. They're all tri-speed fans too; perfect for the air enthusiast who's trying to keep his hearing intact.

ANTEC P190

WHITE RABBIT
Tons of space, snake light inside the case, easy to manipulate.

BLEACHED BUNNY
Still no switch for the snake light; cable management could be better thought out, but it's improved.

9

$500, www.antec.com

Cooler Master Aquagate S1

It's a radiator! It's a fan! It's… not much

If we could give points for looks, Cooler Master's new Aquagate S1 liquid cooling system would rank among the top products we've tested. But sadly, we base our judgments on performance. This thing is supposed to be able to cool a quad core, but it's obviously designed for CPUs less powerful than even the FX-60 in our test machine.

The Aquagate is a sealed, self-contained cooling apparatus that's simple to install. You pop out your rig's motherboard to install the CPU block, which contains the tiniest of pumps; the fan/radiator combo connects to the CPU block with 3/8-inch tubing. We're happy to see that the cooling fan can be adjusted using an included dial. Unfortunately, this silver lining isn't enough to mask the cooler's dark cloud.

Even after we cranked the radiator's fan up to turbo speed, we were rewarded with temps that were only two degrees colder than what our stock cooler produced during our CPU burn test. When the processor was idle, the Aquagate outperformed the stock cooler by less than three degrees. Sure, that's a difference, but you have to spin up the cooler's "silent" fan to achieve it.

BENCHMARKS

	STOCK COOLER	CM AQUAGATE (LOW)	CM AQUAGATE (HIGH)
IDLE (C)	39.5	47	**37**
100% LOAD (C)	54.5	68	**53**

Best scores are bolded. Idle temperatures were measured after 30 minutes of inactivity, and full-load temps were measured after running CPU Burn-in for one hour.

The Aquagate S1 tires valiantly to be a liquid cooler but needs more oomph in the cooling part of the equation.

Since Cooler Master bills the Aquagate as a quieter way to cool your rig than a typical air-cooling solution, we grabbed a nearby fire extinguisher and dialed down the radiator fan. As expected, our rig's stock air cooler outperformed the Aquagate. In fact, when compared to our stock cooler, the Aquagate didn't once produce lower temperatures. Silence is golden, but fires are real; running this cooler on silent mode makes your CPU more a hot plate than a processor, and we truly fear the results if we were to attach this to a more powerful chip.

We're hesitant to recommend the Aquagate as a cooling solution for anything but the weakest CPUs. You're better off sticking cotton in your ears and tolerating the buzz of a better air cooler.

—DAVID MURPHY

CM AQUAGATE S1 **5**

$90, www.coolermaster-usa.com

Thermaltake Big Typhoon VX

This CPU cooler cools well, but it don't look cool

It's hard to look at Thermaltake's Big Typhoon VX cooler and not think one of two things: the most horrific joke you can make about size mattering and the current market price of the Dremel you'll need to cut a hole in your case to make room for this Godzilla of a cooler.

We kid, but only a little. The cooler's 10.3 centimeters of bulky height already makes it quite a space-filler in your rig, but the Big Typhoon's size is amplified by the chunky 12cm fan that rests on top of the device's six heat pipes. Strapping this sucker to a CPU reminds us of those times in SimCity when we would flatten some poor Joe's house to make way for the Eiffel Tower or something equally grand.

But there's nothing to joke about when it comes to the Big Typhoon's performance. It sucks a serious amount of heat from your processor, joining the ranks of our ever-favorite Zalman CNPS9700 as one of the best air coolers we've tested. While the baseline temperature of our stock cooler varied during the testing of the CNPS9700 and the Big Typhoon, both devices cooled our FX-60 by near-identical amounts during our burn test—about 12C. To its credit, the Big Typhoon also comes with a fan-speed adjuster. And even at its lowest setting, the device still does an amazing job. We don't often see quiet-mode coolers beating our processor's default stock cooler. Usually when we lower fan speeds to a silent setting, processor temperatures go up, not down.

BENCHMARKS

	STOCK COOLER	BIG TYPHOON VX (LOW)	BIG TYPHOON VX (HIGH)
IDLE (C)	39.5	32	**30**
100% LOAD (C)	54.5	46	**42**

Best scores are bolded. Idle temperatures were measured after 30 minutes of inactivity, and full-load temps were measured after running CPU Burn-in for one hour.

The Big Typhoon VX is big—but not necessarily beautiful—however, it sure gets the job done.

But getting this cooler on the CPU is the real treat. Snapping the single clip across the device's base takes all of 10 seconds, easily the fastest installation of any air cooler we've seen. Were it a bit less bulky, the Big Typhoon VX would be gusting its way to a Kick Ass for sure.

—DAVID MURPHY

THERMALTAKE BIG TYPHOON **9**

$55, www.thermaltake.com

PC Peekaboo!

The latest in home-surveillance high jinks

The iControl's wireless video cameras still depend on wires for power.

Monitoring your home with a simple webcam is cheap and easy, but it's not very effective. You can't sit in front of your PC watching a video window all day, and while recording the goings on at your property might catch a criminal in the act of breaking and entering, it could be hours or days before you find out about it. These new products can alert you the instant something goes awry.

—MICHAEL BROWN

WILIFE LUKWERKS SURVEILLANCE STARTER KIT

We nearly slapped WiLife's Spy Camera Starter Kit with a Geek Tested: Disapproved label when we checked it out in our May 2007 issue. The camera was poorly disguised in the massive body of a fugly digital clock. But the company's software was so impressive that we called in its Indoor Camera Starter Kit ($300) and an add-on outdoor camera ($230) for a full review.

Each of WiLife's cameras uses HomePlug powerline networking, so you need only plug the cameras into wall outlets, hook a USB receiver to your PC, and install the software. We had a two-camera system up and working within 15 minutes.

The interior camera comes with a desktop stand, a wall/ceiling mount, and a suction cup for mounting to a window. The exterior model mounts to a wall or the ceiling. Both cameras are expensive, but each is outfitted with an onboard 400MHz DSP that compresses and encodes video to WMV9 format before it's ever sent to your PC.

WiLife's software can manage up to six cameras simultaneously with motion-activated video recording, and it can send text or video-clip alerts to your smartphone or email address whenever it detects unexpected activity. You can also establish up to 16 tracking zones for each camera, which enables them to ignore cars traveling on the street, for instance, but activate when someone approaches your door. WiLife also provides a free online account, so you can monitor your cameras from any web-enabled device.

WiLife is a fabulous video-surveillance system—and we dig the fact that there are no monthly fees—but its scope is limited: We'd like to see the company expand this product into a more complete home-control system.

WILIFE SURVEILLANCE KIT

VIDEODROME
Excellent software, strong cameras, easy to deploy.

SHOCK TREATMENT
Spendy, limited to video surveillance.

9

$300, www.wilife.com

WiLife's surveillance cameras are good, but the software that manages them is brilliant.

ICONTROL ADVANCED STARTER KIT

This month, we also reviewed the larger of iControl's two starter kits, which consists of a wireless camera, a motion detector, an Intermatic Z-Wave lamp module, a door/window detector, a motion detector, a keychain remote, and a control module that plugs into your wireless router.

The starter kit is just that: It can be expanded with more than a dozen additional components, including smoke and water detectors, freeze sensors, thermostats, and more. While the WiLife system is limited to video cameras, cameras are but one aspect of iControl's product: It moves far beyond monitoring visual events in and around your home, enabling you to control your home's lighting and climate over the Internet. It also comes with a feature we're not nearly as enthused about: a $15-per-month (or $150 per year) subscription fee.

The WiLife system is limited to generating alerts when its cameras detect motion; iControl's software is more sophisticated: It can not only generate an alert based on readings from any of its sensors, but also alert you when an expected event *doesn't* happen. If your front door doesn't open by 3:00 PM, for instance, you can program the system to send a notification to your PC or smartphone that your child hasn't arrived home from school.

IControl's system is much broader than WiLife's and it's entirely web based, so you don't need to install a software client on your PC. But that $15 per month service charge is hard to swallow.

ICONTROL ADVANCED STARTER KIT

WATCHING
Delivers much more than just video surveillance.

BEING WATCHED
Video surveillance segment is weaker than WiLife's offering; monthly subscription fee.

7

$250, www.icontrol.com

Corsair Flash Survivor GT

This is the USB key CTU agents would use, if they weren't fictional, that is

We burned it, threw it, and froze it—and the Corsair Flash Survivor GT survived.

We've used too many Jack Bauer references lately, but c'mon, how could we review this key and not say it's the one Jackie boy would use?

The 8GB Flash Survivor GT, after all, is shock and water resistant—and if your service automatic runs out of ammo, you can even fling its hard aluminum body at someone's head. But how does it perform?

Quite well, actually. Older keys can deliver great speeds with medium and large files but are painfully slow when transferring small ones. The Survivor GT, however, is speedy with all file sizes in both reading *and* writing tests. So if you need to copy that PowerPoint presentation off of Salazar's laptop before the building explodes, this is the thumb drive for you. The Survivor GT handily beats the original Flash Voyager GT in all our read and write tests.

We also tested the Survivor by dunking it in boiling water, freezing it, flinging it against a concrete wall, burning it with a butane torch, dropping it down four flights of stairs, and attaching it to a car muffler during a lunch outing, and it, well, survived. It didn't look pretty in the end, but the data was still intact.

Not all is perfect with the Survivor though. Our unit, like others from Corsair, didn't include any bundled encryption software, although it is supposed to ship with TrueCrypt freeware. Other small problems: One rubber grip wasn't glued on the unit, and the device made an annoying squeaking noise when closing—not good if two dozen ninjas are parked inside the room you're about to enter. Still, if speed and durability are your top concerns, we can't imagine getting a key that's any tougher than this baby.

—GORDON MAH UNG

CORSAIR SURVIVOR **9**

$140, www.corsair.com

MAXIMUM PC KICKASS

Stanton T.90 USB Turntable

This table is a built like a brick… house!

We'd happily trade some of the Stanton T.90 USB Turntable's scratch-oriented features for a cueing lever.

We received a ton of feedback on our reviews of Audio-Technica's AT-PL50 and Ion Audio's ITTUSB turntables in our May 2007 issue, but since we concluded that neither of those products was fabulous, we brought in this more upscale Stanton model for a look.

We're happy we did. The Stanton T.90 USB costs $100 more than the Audio-Technica and is nearly twice as much as the Ion, but it's jammed with features you won't find in either of those products. It's evident that very little plastic is used in this beast, which had us humming the Commodores's "Brick House" as we hefted it onto the test bench.

The table has a USB interface, so you can digitize tracks in real time and transfer them to your PC in the digital domain, but it also includes an S/PDIF output. If you'd rather perform the analog-to-digital conversion on your PC, there's both a phono output and a built-in RIAA pre-amp with line-level output.

The T.90 features an S-shaped tone arm with an adjustable counterweight and an antiskate dial, which will reduce record and cartridge wear. Stanton includes its own model 500B cartridge in the removable headshell. A direct-drive motor spins the platter at speeds of 33-1/3, 45, or 78RPM, and a pitch slider enables you to bring the platter to a precise speed (using the strobe dots on the platter, illuminated by a light in the on/off switch, as a guide).

Many of the T.90's other features reveal its DJ table genes, but we'd gladly trade them for tools that render the recording process easier. A simple cueing lever, for instance, would make it much easier to record individual tracks, and an automatic tone arm would simplify the process of recording entire album sides. Dual start/stop buttons, an electronic brake, reverse play, and pitch-select are attractive to DJs, but they're not of much value if you just want to archive your vinyl.

Those criticisms are more than enough to withhold a Kick Ass award, but this is the best-sounding turntable we've auditioned yet.

—MICHAEL BROWN

STANTON T.90 TURNTABLE **9**

$300, www.stantondj.com

Stream Dreams

A/V streamers move up to 1080p

The A/V-streamer market has matured to a level where we're no longer willing to make allowances for missteps. Can either of these products stand up to that kind of scrutiny?

—MICHAEL BROWN

If you have more than one Netgear EVA8000 in the house, you can pause video playback on one, go to another room, and pick up where you left off.

MEDIAGATE MG-350HD

We found some innovative ideas inside the MediaGate MG-350HD, but this streamer's shortcomings far outweigh its assets.

Designing the shell to accommodate an optional 3.5-inch hard drive, for instance, is brilliant; ditto for including logic enabling it to operate as a USB 2.0 host. This means it can not only behave as a NAS box but also copy images off your digital camera without you having to first fire up your PC. But we're less enthused about having to do a reach-around to access the USB port, and the hard-drive interface is old-school IDE.

The MG-350HD is capable of streaming video at resolutions up to 1080p, but it's equipped with a DVI port, not HDMI. While it's no big deal to buy an adapter or a special cable to connect it to your TV or A/V receiver's HDMI port, you'll need separate cables to run audio.

It would be easy to overlook connector shortcomings if the device performed flawlessly, but the ugly user interface is so clumsy that it literally refers you to the user manual to figure out how to stream Internet radio. What's worse is that you won't *find* any such coverage in the nearly incomprehensible documentation.

We streamed standard-definition video over an 802.11g network without a hitch, but it should surprise no one that the player chokes on HD content unless it's hardwired to the network. The MG-350HD supports a variety of audio codecs, including MP3, OGG, WAV, and WMA, but the only way it can stream music during a photo slide show is if the music is stored on its local hard drive. Lame.

Add MediaGate's MG-350HD to the hordes of A/V streamers that look out of place in the typical consumer's entertainment rack.

MEDIAGATE MG-350HD

6

REEFER MADNESS
Accommodates an internal hard drive (not included); can act as a USB host.

SHE GODS OF SHARK REEF
No HDMI, doesn't support FLAC; as configured, cannot stream photos and music simultaneously.

$250, www.mediagateusa.com

NETGEAR DIGITAL ENTERTAINER HD EVA8000

We like Netgear's EVA8000—a lot. Its industrial design fits in with the rest of our AV gear, its user interface is as elegant and polished as it is easy to use, it supports resolutions up to 1080p with an HDMI port, and that's just the beginning.

But if you buy one, make sure it has the latest firmware update before you do anything else. We couldn't configure our review unit at all until we updated the software. With that housekeeping accomplished, we were on our way to streaming bliss. Although the EVA8000 has dual antennas, it's still limited to 802.11g speeds and cannot reliably stream high-definition video content without a wire, but it delivered excellent image and audio quality.

Like MediaGate's product, the EVA8000 can act as a USB host, but its port is conveniently located right up front. And unlike the MG-350HD, Netgear's box *can* stream digital photos and digital music at the same time (it loaded images much faster, too). In addition to support for all the usual audio, photo, and video formats, the box can also stream and decode FLAC and even audio encrypted with Windows Media DRM (rendering it compatible with subscription music services such as Yahoo, Urge, and Napster). It won't work with Rhapsody, however, because that service uses a DRM scheme all its own. It doesn't support WMA Lossless either.

The EVA8000's excellent user interface makes streaming content from the Internet stupid-simple, with direct links to (and great search tools for) movies and TV shows on BitTorrent's retail site, digital photo collections on Flickr, and every video on YouTube. (But if you find low-res videos hard to watch on a computer monitor, wait until you see them scaled up to 1080p on a big-screen TV—not good.)

NETGEAR HD EVA8000

9

MAXIMUM PC KICKASS

THE PERFECT STORM
Interface support for popular Internet media; program guide and PVR for PC TV tuners.

POSEIDON
No Rhapsody support; crashed once during testing.

$350, www.netgear.com

Tritton AXPC Headset

Two steps forward, one step back

The AXPC headset has convenient in-line volume control, but we could do without the goofy "rumble" effect.

We reviewed Tritton's Audio Xtreme 360 headset in our July issue. As you can tell by its model name, that device is aimed as much at console gamers as it is movie watchers and PC gamers. The AXPC is a little simpler, better suited to PC users, and nearly $50 cheaper. But it sounds just as mediocre.

The AXPC shares its stablemate's 5.1-channel surround-sound speaker design—four 30mm drivers in each earpiece—but it doesn't have a Dolby Digital decoder module. It also doesn't have the Xtreme 360's ability to host a second set of phones, but neither of these factors are shortcomings for PC cans. The fact that this headset relies on your PC's USB port, on the other hand, is a negative for anyone with a dedicated soundcard. The AXPC offers only EAX 2.0 support—not very impressive when you consider that Creative has taken EAX to version 5.0.

Tritton, however, did improve the detachable microphone in every respect: The flexible stalk attaches via a threaded mount (as opposed to the thin wire and plug on the 360), it delivers superior voice quality, and it's far better at rejecting extraneous background noise (an important advantage if your PC has noisy fans).

While testing with the included helicopter demo (as a crudely rendered helicopter circles your head, the sound of its engine is supposed to follow), the AXPC was very effective at fooling our brains into believing that the helicopter was actually behind our heads. The effect was marred, however, by severely abrupt transitions from the front to the side and from the side to the back—the sound just cuts out from one speaker and resumes in the other.

The AXPC's "rumble" effect drove us nuts, and there's no way to defeat it other than to switch the phones to 2.1-channel mode. The rumble isn't force feedback, in which specific events in the game cause a physical effect; the earcups simply vibrate in response to low frequencies. Bleh!

—MICHAEL BROWN

TRITTON AXPC HEADSET **7**

$75, www.trittonusa.com

SilverStone Ensemble EB01 External DAC

Sexy and cheap, but not without some compromises

SilverStone's EB01 looks sexy enough, but its reliance on USB power leads to some sacrifices in resolution and features.

When we decided to test external digital-to-analog converters (DACs) for the upgrade story in our June issue ("19 Bright Ideas: Upgrades You Didn't Know You Needed"), we were surprised to learn that SilverStone offered one with pretty decent specs. We recommended Stereo-Link's upscale A1300 in that story, but SilverStone's less-expensive EB01 is a solid value.

As we pointed out in the June issue, there's a widespread misconception that digital audio is an all-or-nothing affair, and so the quality of the equipment you use to extract it doesn't matter. It's common knowledge, for instance, that getting audio physically off the electrically noisy motherboard results in cleaner sound, so it's understandable that keeping audio in the digital domain until it's entirely out of the PC would also help maintain its sonic integrity.

Stepping down in price from the $225 Stereo-Link E1300 to the $90 SilverStone EB01 does require making some compromises. While the E1300 uses a 20-bit DAC, the EB01 delivers only 16 bits of resolution (although the Burr-Brown PCM2072E is certainly a good component choice). More importantly, the AC-powered E1300 includes a built-in 25mW headphone with a thumbwheel volume control in addition to its line-level RCA outputs; the EB01 can't draw enough power from the PC's USB bus to support that feature. In fact, its reliance on USB power is the likely reason SilverStone spec'd a lesser DAC. From an industrial-design standpoint, on the other hand, the EB01's curvaceous brushed-aluminum case leaves the E1300 looking like a wallflower.

When using the EB01, "Venus as a Boy," from Bjork's *Debut*, sounded like a delicious layer cake, with ultra-crisp highs, sweet mids, and thick-as-chocolate lows. If you already own an X-Fi card, the EB01 won't deliver any additional benefits. And a soundcard would be a better upgrade choice over both Stereo-Link's and SilverStone's offerings if games are your principal audio application. But if your PC is your primary music player, you always rip your CDs to a lossless format such as FLAC, and you're still relying on motherboard audio, your ears will appreciate what the EB01 has to offer.

—MICHAEL BROWN

ENSEMBLE EB01 DAC **8**

$90, www.silverstonetek.com

3DConnexion SpaceNavigator Personal Edition

Time-wasting has never been so easy to control

Quick, call Maxwell Smart. We've identified a KAOS plot aimed at destroying American worker productivity. Now thanks to 3DConnexion, that evil plot to have 90 percent of Americans flying all over the globe using Google Earth—instead of working — just got easier, and thus more KAOtic.

Meet the SpaceNavigator Personal Edition, which works as a controller for 3D applications like Google Earth and NASA World Wind. The 3D knob on the device lets you effortlessly rotate, pan, tilt, or change altitude with simple wrist movements in some 3D applications. To gauge the performance of the SpaceNavigator PE, we staged several Google Earth races among the staff to see who could traverse the globe more quickly, going from Manhattan to Seattle or Mt. Everest to the Kremlin—without touching the keyboard. In the end, all we did was waste an afternoon calling out random locations and racing to them. After hours of serious testing, we found that the SpaceNavigator didn't provide any advantage in our races.

The SpaceNavigator isn't all about play, though. The bundled driver includes support for Maya, AutoCAD, 3ds Max, SolidWorks, and a dozen other apps. In 2D apps like Photoshop, the SpaceNavigator lets you slide an image around, zoom in, or change brush sizes by jiggling the knob. Unfortunately, the device doesn't include support for gaming or the ability to program it for applications it doesn't recognize. 3DConnexion said this is because the device's driver is complex, doing more than simple key-presses, so it would be difficult to adapt it for games that expect you to mash WASD to move around.

The SpaceNavigator spins you right round, baby, right round.

That limitation is ultimately what really hurts the SpaceNavigator PE. While we appreciate the fact that this type of device cost $300 two years ago, a controller whose main commercial appeal is limited to Google Earth and a few other apps is of limited value. Don't get us wrong though, it is effective and if we had $60 to burn and our second job was flying around on Google Earth, we'd buy one. However, the lack of programmability and extensibility really sticks in our craw.

—GORDON MAH UNG

SPACENAVIGATOR **7**

$60, www.3dconnexion.com

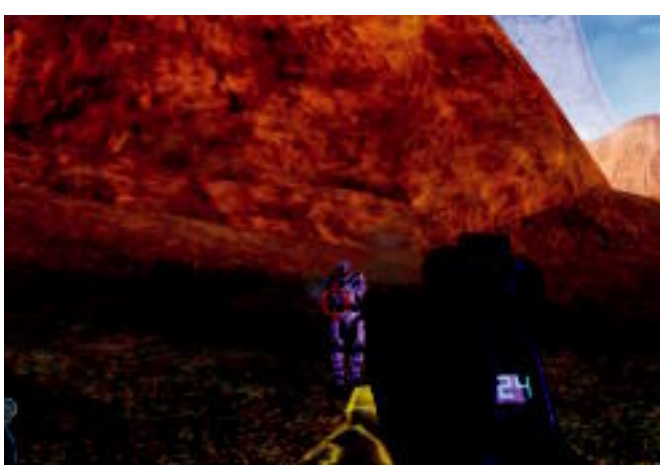
Halo 2 for Vista

Just released for Vista: the same game I played 24 months ago on Xbox

I played a lot of Halo 2 on the Xbox. Every night for most of a year, I'd fire up the game with some buddies, lead off with a couple of swords-only rounds on Lockout, then jump into Coagulation or Zanzibar for some CTF or team deathmatch action. For that reason, I was looking forward to playing Halo 2 with the superior mouse/keyboard combination when it finally came to the PC.

Halo 2 for Vista is essentially the same game that was released for the Xbox in November of 2005. You fight the Covenant on Earth, just like in the Xbox version. An amazing twist is in the single-player campaign, just like in the Xbox version. The single-player story stops just as abruptly as it does in the Xbox version. And the multiplayer kicks as much ass as the Xbox version's. However, the biggest problem is that there just aren't many people playing. Even when you log on during prime time, you don't see many people playing online. At best, there are just a few dozen populated servers. Generally, there aren't enough players for matchmaking (a feature in the paid version of Live) to work properly.

The most notable addition to Halo 2 for Vista is that it's one of the first titles that supports Games for Windows Live—the PC-specific version of Xbox Live's friends and matchmaking services. Once you get Live working, you'll see your friends list and have a bevy of communication options (text messages, voice messages, or live chat) within the game. I experienced some compatibility problems with the service but managed to get it working with a little help (see **http://tinyurl.com/2z6jk9** for more info). You need to pay $50 a year for the privilege of getting all of Live's features, but a subscription works for both PC and 360 games, so current subscribers to Live can log in and play immediately. Without a subscription, you won't have access to matchmaking (which doesn't work) or multiplayer achievements. Woo.



The heart is a lonely hunter when you can't find anyone to gun down on Halo's deserted servers.

Despite the crappy graphics and very first-gen implementation, this is still a brilliant game. Of course, it's a brilliant, almost three-year-old game with a $50 price tag.

—WILL SMITH

HALO 2 FOR VISTA **7**

$50, www.halo2.com
ESRB: M

Shadowrun

No, we've never played the pen-and-paper RPG either

Dwarves drain the "essence" from anything near them, including players and magical items like the Tree of Life.

We were skeptical when Microsoft announced that Shadowrun would be the first game to support full cross-platform multiplay between PCs and Xbox 360s. Being staunch advocates of the keyboard and mouse in first-person shooters, we were worried that the developers at FASA would dumb down Shadowrun to even the playing field for our gamepad-wielding counterparts. Luckily, after several weeks of playing the game, we can report that it is not only fair and balanced for all players but also a truly innovative multiplayer experience that's loads of fun.

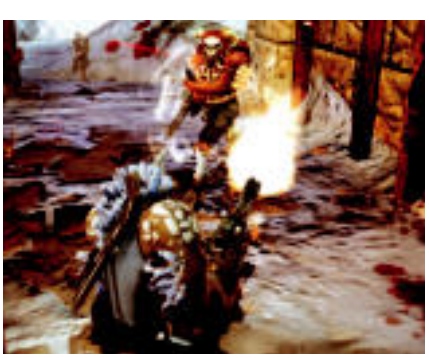
A couple memorable in-game scenarios highlight Shadowrun's standout features. On the Temple Grounds map, the red Lineage team mounts an assault up a massive ziggurat while the blue RNA team tries to protect an artifact from being captured. As an RNA defender, we chose to be an elf, one of the four classes available to all players. With increased speed and magic capacity, we sped around the map, using purchased spells to teleport through corners and surround the artifact with deadly spikes. Other teammates chose the heavy troll class and unleashed a barrage of bullets while being protected by their reinforced hides. Another crafty team member played as a dwarf, sucking away magic from enemies and flanking them with a high-flying glider.

And that's the beauty of Shadowrun. With four classes, an arsenal of weapons, and numerous magic and tech abilities to purchase, every player can design a character to match their play style. On the Favela map, where both teams rush for an artifact in the Extraction mode, we won numerous rounds by playing pure defense. Trolls guarded the capture point while the rest of the team saved money between rounds for defensive abilities like antimagic generators and minion summons. The impressive number of class/weapon/ability combinations meant that teams really had to work together to counter opponent strategies.

This proved most true in the Attrition game mode, in which a team can win only by killing off everyone on the opposing team. In one match on the Nerve Center map, our team lost the first few rounds quickly because everyone chose to buy weapons early but failed to purchase the resurrection ability. No matter how many times we killed an enemy, he would be revived by one of his teammates. But once we learned to stick together and make judicious purchases, we turned the tide for a narrow victory.

Also surprising was how hard it was to distinguish between PC and console players in-game. The interface and menus don't make the distinction, and we couldn't tell based on skill or movements either. That's a testament to how seamless the cross-platform play really is, though connecting to games with the TruSkill matchmaking system often took several minutes. We were also disappointed that the developers scrapped plans for a story-based campaign, since the game's nine maps were a little worn out after a week of play. The biggest kicker is that Shadowrun also requires Windows Vista, even though it doesn't use DirectX 10. So although it's a highly addictive and fun multiplayer game, a few quibbles hinder its true potential. Wait until Shadowrun drops in price before picking it up.

—NORMAN CHAN



Both of these trolls are growing spikes as they're hit with bullets in order to take less damage.

In any other game, a helmeted dwarf soaring on a glider would be a joke. Here, he's an unstoppable killing machine.

SHADOWRUN

KEYBOARD AND MOUSE

Innovative multiplay; balanced teamplay; seamless cross-platform support.

GAMEPAD

Connection problems; limited gameplay modes and only nine maps; no single-player game.

8

$50, www.shadowrun.com
ESRB: M

Win Rig of the Month AND WIN BIG!

IF YOUR MODDED PC IS CHOSEN AS A RIG OF THE MONTH, IT WILL:

1. Be featured before all the world in *Maximum PC*
2. Win you a $500 gift certificate for Buy.com

SO WHAT'S STOPPING YOU?

TO ENTER: Your submission packet must contain your name, street address, and daytime phone number; no fewer than three high-res JPEGs (minimum size 1024x768) of your modified PC; and a 300-word description of what your PC represents and how it was modified. Emailed submissions should be sent to **rig@maximumpc.com.** Snail mail submissions should be sent to Rig of the Month, c/o Maximum PC, 4000 Shoreline Court, Suite 400, South San Francisco, CA 94080.

The judges will be *Maximum PC* editors, and they will base their decision on the following criteria: creativity and craftsmanship.

ONE ENTRY PER HOUSEHOLD. Your contest entry will be valid until (1) six months after its submission or (2) October 15, 2007, whichever date is earlier. Each month a winner will be chosen from the existing pool of valid entries, and featured in the Rig of the Month department of the magazine. The final winner in this contest will be announced in the April 2007 issue. Each of the judging criteria (creativity and craftsmanship) will be weighed equally at 50 percent. By entering this contest you agree that Future US, Inc. may use your name and your mod's likeness for promotional purposes without further payment. All prizes will be awarded and no minimum number of entries is required. Prizes won by minors will be awarded to their parents or legal guardians. Future US, Inc. is not responsible for damages or expenses that the winners might incur as a result of the Contest or the receipt of a prize, and winners are responsible for income taxes based on the value of the prize received. A list of winners may also be obtained by sending a stamped, self-addressed envelope to Future US, Inc. c/o Maximum PC Rig of the Month, 4000 Shoreline Ct, Suite 400, South San Francisco, CA 94080. This contest is limited to residents of the United States. No purchase necessary; void in Arizona, Maryland, Vermont, Puerto Rico, and where prohibited by law.

We tackle tough reader questions on...

Eastern Europe ✓Cooling Your Optical Drive ✓Enhancing Ads ✓Net Nanny Redux

WE'RE KEEPIN' IT COOL

In "Target Your Hotspots" (July 2007) you say many times that optical drives do not need any extra cooling, and the thermal images in the story concur with that. I was wondering what the drives were doing when the images were taken? Were they idle? Reading a disc? Writing a disc? Optical drives are not used as extensively as the rest of a PC and therefore can stay significantly cooler. When they do go into action, however, they can get hot. With drive speeds getting faster and faster, more heat is generated, albeit for less time. If heat could cause a DVD burner to "die," maybe a little cooling is in order if you use the drive a lot.

—Yonasan Resnick

ASSOCIATE EDITOR DAVID MURPHY RESPONDS: For all of our thermal shots, we were running Oblivion with all the details maxed out. The computer was accessing the drive as it normally would through the course of gameplay. While an optical drive will get warmer when you're burning to media, virtually any part on a computer will get warm if you run it at its peak operating capacity for a long time. If we were to run the CPU at 100 percent for 24 hours a day, we'd recommend more powerful cooling for all of the motherboard hotspots. We'd also call that computer a server and stash it in a frosty room.

With average use, though, an optical drive needs no cooling. If you plan to spend the entirety of your day burning DVDs, then yes, you might want to reconsider the airflow of your case just a bit, if for nothing else than to ease your own cooling fears.

OUR APOLOGIES

*I have been an avid reader of **Maximum PC** for more than two years. Last month's issue (July 2007) had an advertisement for male enhancement pills. At first I thought to myself, "What does a man's sexual life have to do with fast computers?" Then I thought that it was possibly a mistake and wasn't supposed to be in there. Well, I read through the next issue (August 2007) today and there it was again. Now I know it was not a mistake. As of now, I am terribly upset with **Maximum PC** for putting this advertisement into the magazine on purpose. What gives?*

—Ryan Hankins

EDITOR IN CHIEF WILL SMITH RESPONDS: As a general rule, it's a good thing that we maintain a healthy separation between the editorial staff and the advertising staff at *Maximum PC*. That prevents advertisers from influencing the editorial content of the magazine. It also means editors don't have any control over the ads that run in the mag. This is also a good thing.

We do, however, forward readers' complaints to our publisher. After hearing from you and many other people, our publisher pulled the ad from the September issue (and all issues going forward). You can rest assured that we won't be running ads for those types of products again.

FREE HIGH DYNAMIC RANGE

As an avid (albeit amateur) photographer, I was thrilled to see your how-to article about high dynamic range photos (July 2007). However, in my capacity as a crusader for free software, I feel obligated to let you know that you can create HDR images without taking out a second mortgage for Photoshop or Photomatix.

*There's a lovely program called FDR Tools (**http://tinyurl.com/olpot**) that does the job nicely and is free. While it may not have all the bells and whistles of Photomatix, it does create perfectly fine HDR images (you can see an example at **http://tinyurl.com/2ewusx**).*

Thanks for taking the time to listen to the ranting of a cheap photographer.

—Ken Bauer

PROTECTING YOUR KIDS, PART 2

Kudos for your story on cracking parental-control programs (July 2007). Now, can we have the rest of the story? I would really like to know how to help programs like Net Nanny become uncrackable, preferably without having to reverse engineer your article. My challenge to you: What can you do to make these programs as secure as possible? I know nothing can be completely secure, but how close can you come? Some steps seem elementary, like using a secure Windows password not known to everyone in the family. That makes it harder to do anything requiring a reboot. Your article was quite eye-opening; now how about something that really helps.

—Jo L. Will

E-ducation on Estonia

*While reading the August 2007 issue of **Maximum PC** (a great one, by the way), I could not help but notice that the previous 68 years didn't seem to elapse in Estonia. The map below your article about Estonia's recent DDoS trouble ("E-strike on Estonia," Quick Start) shows the boundaries at their 1918–1939 locations, not their present ones. Have I missed a hole in the time-space continuum?*

—Tom Fahey

SENIOR EDITOR KATHERINE STEVENSON RESPONDS: Seems like our attempts to better educate readers on Estonia's whereabouts only served to expose our own shaky grasp of the geographic arts. Unlike you, Tom, we don't really focus on borders—you know, the global village and all. But just so we're all on the same page, and in the same era, here's an updated map of the region. Our apologies to Estonia and its neighbors.

SENIOR EDITOR GORDON MAH UNG RESPONDS: The good news is that the steps required to secure one app will work for most others. First, you need to secure the BIOS with a password and change it every month. You should also lock out the USB ports to prevent the use of USB flash keys to install or run applications and USB Wi-Fi adapters. Also, it's a good idea to remove the floppy and optical drive from your boot order to prevent Timmy from booting off of either of those devices. Then, you'll need to physically lock the case so that little Timmy can't just reset the BIOS to undo all of your changes.

When you get into Windows, you'll need to set up a limited-access account for your li'l troublemaker instead of allowing him to use an Administrator account. To do that in XP, go to the Users control panel, select Timmy's account, and set the role to Limited User. (Be aware that this will prevent many games and even some basic apps like CD burners from working properly.)

This should be enough to keep all but the most industrious tykes from disabling the protection apps. If Timmy is really enterprising, you might want to consider random room searches before lockdown, err, bedtime.

WOULD YOU LIKE SOME CHEESE WITH THAT?

The very fact that it will take a Core 2 Extreme processor, two gigs of Corsair RAM, and an $875 8800 XXX Edition videocard to run Supreme Commander in SLI and still average under 40fps makes me wonder about the future of gaming. That seems to be a pretty big investment for a $50 game. I am still using my trusty 6800 GT and will not even attempt buying this game for my rig. Why bother? Unless gaming vendors can start designing their games for reasonable hardware, we may as well pitch our PCs and give in to the Xbox. For the price of a full-featured gaming rig, we could even buy a big-screen TV.

—Jim Hall

EXECUTIVE EDITOR MICHAEL BROWN RESPONDS: What can I say, Jim? PC gaming can be an expensive hobby. But you need to remember that you're not making the investment for a single game. And wouldn't you rather see developers push the envelope and take advantage of the latest hardware than lag behind the market in an effort to sweep more customers into their nets? Console game systems challenge the PC status quo when they're first announced, but they're usually surpassed by PCs by the time they're a year old, and they look like toys as they near the end of their useful lives. And there's not a damned thing you can do about it because they're closed systems. PCs can be upgraded to whatever the state of the art may be for many years after their introduction. Having said that, skipping one generation of videocards isn't a bad idea for a cost-conscious gamer. I think you'll find skipping two in a row to be painful.

CABLECARD CONUNDRUM

This is in response to "Attack of the Home Theater PC" (August 2007). The CableCard fiasco you experienced is nothing new. I'm a field service tech for my local cable company and will say I've seen more problems related to CableCards than I care to shake a stick at. I saw one TV that produced a black screen the first time it was turned on in the morning; turn it off and then back on and it's fine for the rest of the day. I personally went out to this customer's house four times for this issue. We replaced everything from the out main line to the TV itself and replaced the CableCard multiple times.

I wouldn't blame Comcast for your issues. I would blame the problems on ATI and CableCard. That technology has yet to earn its merit, especially since right now it's a one-way communication device. People who buy products for CableCards are going to be out of luck once two-way CableCards are introduced. This is not a good time to get a CableCard.

—Jim A.

EXECUTIVE EDITOR MICHAEL BROWN RESPONDS: Velocity Micro reconfigured, retested, and resent the rig they'd provided us with earlier, so we're going to contact Comcast and try again—look for our coverage at www.maximumpc.com. S1 Digital still hasn't received its CableCard tuner order, and Voodoo has since decided that the technology isn't mature enough for the company to even offer. The CableCard tuner market is clearly not in good shape, and I can't help but believe that this is going to ripple through the entire media-center PC market.

I'm not personally bothered by the one-way nature of the current technology, because I almost never use on-demand or pay-per-view services, but we'll certainly continue to make our readers aware of that drawback. But it will become a moot point if the companies involved can't get the technology to work in the first place; wherever the problem ultimately lies, I see very little mainstream value in high-priced media-center PCs that can't be connected to digital cable or satellite TV. MPC

LETTERS POLICY: ***MAXIMUM PC*** invites your thoughts and comments. Send them to **input@maximumpc.com.** Please include your full name, town, and telephone number, and limit your letter to 300 words. Letters may be edited for space and clarity. Due to the vast amount of e-mail we receive, we cannot personally respond to each letter.

COMING NEXT MONTH IN MAXIMUMPC'S

MAY CAUSE SWELLING OF ANKLES OR FEET

OCTOBER ISSUE

PC-PUNISHING GAMES

We'll walk you through the 10 most technologically advanced games either out now or on the horizon. Does your system have the huevos to handle 'em.

BUDGET BUILD-IT CHALLENGE

In a timed competition, two *Maximum PC* editors must each shop for and build a functioning PC, with less than a grand between them! Whose will be the better performer?

AWESOME WEB APPS

We know, hype about Web 2.0 is everywhere (shoot, even Gordon's mom is into it!), but we're going to sift through all the sissy stuff and show you THE new-gen websites a PC power user should care about.

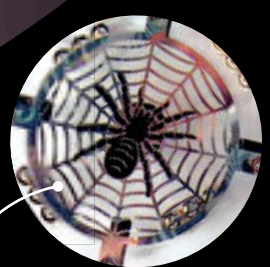
JASON DUMBAUGH'S

Spider-Man/ Venom

While the latest Spider-Man film was met with mixed reviews, Jason Dumbaugh's Spider-Man/Venom mod is a must-see blockbuster. Sporting a multitude of spiders—both inside and out—as well as a tangle of webs and ooze, this rig captures the feel of the film.

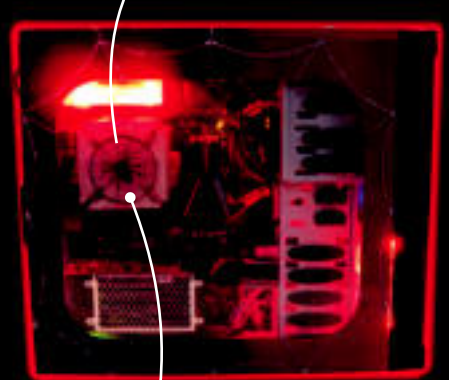
Jason, who wrote a step-by-step tutorial on how to create this mod at Techwarelabs.com, built the case for his roommate, a Spider-Man superfan. He explained that apart from a few minor missteps, the process was pretty straightforward. Great job, Jason, we'll be watching for your Iron Man mod in the summer of '08!

After wiring up and epoxying 26 LEDs, Jason realized that in such a configuration, each light would need its own resistor. The final design features five lights.



Jason first created a stencil in Photoshop and then cut the spider image out of a piece of 26-gauge zinc sheet metal.

By applying eight layers of clear coat after affixing the webbing and ooze, Jason ensured this rig could take some abuse but continue to shine.



The spider motif carries over to the interior of the rig, which also sports a red LED fan.

For his winning entry, Jason wins a $500 gift certificate for Buy.com to fund his modding madness! See all the hardware deals at www.buy.com, and turn to page 108 for contest rules.

If you have a contender for Rig of the Month, e-mail **rig@maximumpc.com** with high-res digital pics and a 300-word write-up.

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